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Markku Nikkanen

ESSAYS ON INTERORGANISATIONAL CONVERGENCE AND DIVERGENCE

Case of Logistics Nets and Networks

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Content

Foreword

This publication is a compilation of the writer's essays in a three-year time period (2003 - 2005). During the analytical and empirical endeavour, it was found out that there is substantial need to reveal and present emergent orientations in logistics, in which the prevalence of traditional approaches is still evident. This is particularly true in modern supply chain management, where restrictive conventions still dominate the attempts to enlarge the research horizons.

The logic of networks and their intricate nature, complicated by the dispersed interests of various actors, creates an impressive portrayal, which is quite a different from the one often understood in managerial approaches. SCM-oriented researchers often have a picture of the reality that is bluntly simplified. The writer of this publication hopes that the book can give new ideas, proposals and insights for the discussion on the future of logistics analysis among scholars and practitioners.

During 2004 – 2005 I held a position of a Principal Lecturer at Laurea University of Applied Sciences. The publication would not have been possible without the support of various people at Laurea. I thank all of them collegially. Also the various informants need particular thanks for participating in the interviewing sessions.

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Introduction to the Publication

There has been growing interest recently to study and analyse networks, both among academics and practitioners. Conceptually, a network constitutes of a *set of diverse interconnections among and between actors.* The actors are often firms or other organizations – as in this study – but they can also be human beings or groups of firms working together. There are various interpretations of the interconnections that tie up the multiple network members; e.g. according to the International Marketing and Purchasing Group (IMP) school of thought the actors are connected with actor bonds, resource ties and activity links creating networks. Generally speaking, the research concerning network-like phenomena – as this publication – addresses an area of considerable and growing contemporary interest.

As firms and companies become more global, it has been realized that the success depends not simply upon the performance of individual companies, but rather in the collective performance of all the actors engaged in the networks. Traditionally – especially in logistics theory and practice – the interdependency of the collaborative parties (called actors) in the supply chains is determined by physical flows (of goods or information). The other viewpoint presented in this study is defining these chains as genuine and true net(work)s organically tied together, both by implicit and explicit contracts and by relationships (caused by the interaction), to achieve specific ends.

In logistics research, there seems to be a need to increase understanding that is gained from theoretical discussion and empirical verification. The dissection of networks is a challenging task for the research work, and in order to gain development in analytical attempts, utilisation of several disciplines is required. There is also a need for a moderate cross-fertilisation, especially between managerial theories (represented e.g. by the Supply Chain Management (SCM) -model) and network theories (IMP-Group as a representative example). In logistics, the analysis is traditionally based on tools and ideas, which are in conjunction with (Demand) Supply (Chain) Management –based modeling. Despite its popularity among practitioners and scholars, the inherent studies are still characterized by some normative implicit assumptions of the reality and the idea of a mechanistic worldview.

The roots of network analysis can be characterised in many ways, depending on the application environment. In accordance with the original environment, different terminology and analytical approaches have been created. Typically, a distinction has been made between concrete networks (physical and infrastructural networks) and abstract networks of relationships (firms, organisations, people, knowledge elements). Also a classification between physical and non-physical is widely applied (e.g. Capineri and Kamann 1998, 36). Thus, there is both a network theory and a network explanation or a model for different practices and purposes. Conventionally, an infrastructural network is defined as a set of connected nodes and links.

A network describing a social structure consists of different types of social relationships between the parties and partners involved. A network is thus a model of a complex reality or a view with a distinctive nature (see e.g. Nikkanen and Lukka 1999 for more discussion).

Objectives and Scope

The main objective of this publication is to discuss and analyse interorganisational convergence and divergence using mainly logistic net(work)s (or systems) as the application area. In other words, in this study the aim is to increase the understanding of interorganisational coherence and collaboration especially in those net(work)s which are labeled by diverse tying elements and are thus often subject to structural bonding. Coherence implies organisations' intentions for working in closer co-operation, hence aiming at capturing the positive yields and rewards but exposing themselves to risks as well. Reduced independency, threat of opportunistic behaviour or asymmetry in terms of power exemplifies some negative effects of the network presence. A single actor is obliged to cope with all the effects of the network presence whether the influences are positive or negative. Even explicitly, a single relationship that links two partners together on dyadic level, includes aspects of co-operation, competition and conflicts.

Cohesion and convergence as terms link the present analysis also to the trends of modern sociological thinking. Sociology is actually a study of human interaction, which takes place on distinctive stages (dyadic, system, even society). Burrell and Morgan (1977) use a dualistic distinction to cover two approaches – actually two sociologies – which affect the way the researcher observes and perceives the reality (e.g. the modern society). The regulation type of sociology provides explanations of the society, typical for which are unity and cohesiveness. If this serves a starting point in analysis, the questions of consensus and

e.g. social integration are under scrutiny. The other type of sociology – radical change – refers more to social conflicts, which means that contradiction is prevalent and accepted, when the conformities of the society are evaluated. These features do not influence only the society itself (as an organized entity) but also the explanations as well. In the sociology of radical change the non-consensual and contradictional elements (of the society) are emphasised. One of the major contributions of the network view is that also problematic areas of the network engagement are present and scrutinised. Therefore, a more radical analytical and descriptive orientation is required - also in logistics analysis.

Besides co-operation and integration, proper attention should be paid to competition and stress - not just in a particular relationship – but on network level as well. A network engagement means that an actor might be subject to structural conflicts through the position it holds. Understanding convergence and cohesion (as assumed in the sociology of regulation) requires also consideration of contradictions which need to be analysed.

In managerial approaches (implicitly) unpleasant issues are often ignored; explicit analysis is thus required in order to create a more comprehensive portrayal of logistics. Inevitably the classification includes all the cons of the simple reductionistic dualism, which means that these two different orientations are rather contiguous in relation to each other rather than totally separate.

When firms (or organizations) pursue a network logic, they are forced to employ quite a different logic in their business practices compared to traditional models. A real network is actually a constellation of various, overlapping nets, which are identifiable subentities of the entire network structure. Hence, the interorganisational processes (e.g. exchange, co-ordination, adaptation) that is profound for in mutual interaction, take place often on the internet level (one particular net e.g. a social one *vis-à-vis* an other) instead of solely on dyadic or network level; a network is often a dim and unclear concept as the boundaries of the networks are rather blurred in nature. It means that most of the partners have limited or no knowledge of all the partners in one specific network and they can not interact properly with these partners either.

Encountering the Challenges of Logistics Research

As regards logistics research, the following depiction can be present the contribution of different perspectives for contemporary logistics analysis (see Arbnor and Bjerke 1994, Nikkanen 2003, Nikkanen 2006 ; also essays 2 and 3).

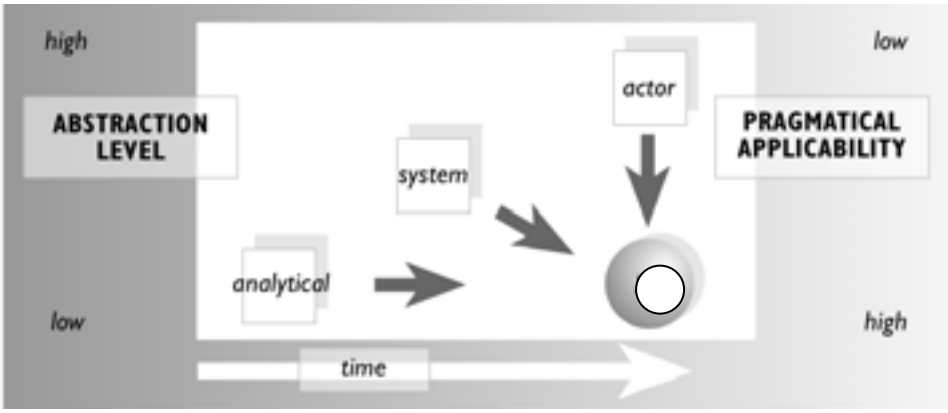

Figure 1. Analytical Orientations in Studying Logistics Networks

It can proposed that that there exist three different orientations (analytical, system, and actor-based; Arbnor and Bjerke 1994) that have an impact on logistics research. Under the *analytical* orientation the researcher aims at seeking the causal relations between the cause and effect (deterministic or stochastic); it is assumed that the reality is objective and the knowledge does not depend on the observing individuals. The *systems* approach views the reality in a different manner: the reality is objectively accessible. The conventional (Demand) Supply Chain Management (DSCM)- model as a conceptual and theoretical framework reflects both the analytical and system-based orientations; in inherent studies the infrastructural networks (with nodes, hubs, transhipment points and links) are mostly under interest. Also e.g. interoperability is highly addressed. The *actor* view means that the whole exists only as meaning structures, which are socially constructed. Also, the power of dialectics is recognised. This worldview is linked with the idea of interaction; diverse nets and interorganisational networks, which can be described as sets of relationships, are resulted. Thus, the reality can be viewed also as a social construction, which means that every actor has a limited ability to comprehend the conformities of the real world fully.

In the articles of this study a comparison is often made between the ’managerial’ (reflected by SCM-based modelling) and ’network’ views. It is also proposed that both these views are required in order to create a more comprehensive presentation of logistic networks. This is because there are some limitations in SCM-based thinking.

Although SCM and its managerial nature are an essential part of modern logistics thinking, some critical notes have to be added (see also Essay 2). New and Payne (1995) associate SCM with unhelpful research practices, because it has some weaknesses: enough empirical evidence may not be found and the basis may not be a relevant one to support the basic ideas firmly. As a result, a widely-accepted discipline can be harmful as it can be a '*wisdom*'; the theory stipulates the norms for analysis, defining what is a valid approach and what is not. According to New and Payne, the domain is too broad and wide, and thus it reduces the scholars' ability to find out the real points: '*it becomes less clear what differentiates the subject as a distinctive field, and what constitutes valid research questions and investigative strategies'* (New and Payne 1995, 69). Moreover, the use of SCM has an impact on the research strategies as well; the use of deductive reasoning has guided the scholars in logistics, and the use of inductive (or abductive) reasoning has not been in focus (as often in actor-based orientation; compare to Fig. 1).

Supply chain thinking is mainly applicable for conditions in which a traditional manufacturing industry is performed, and it is not so well suited for explaining the regularities in service industry. Furthermore, the value creation logic in the supply chain theory is problematic: value is created through sequential activities, with interlinked, partly overlapping or extended value chains. It is evident is that the relationships *per se* have value and the processes are more non-linear, parallel and matrixed by nature.

In networks it is not often a question of how the firms operate, but rather how the actors in a broad scope are involved in the network/net. This also means that much of the interorganisational behaviour is as much interpersonal as based on formal and rational decision-making across firm boundaries. Accordingly, the question of a real win-win situation is problematic on a wide network level, as the participants in the network tend to hide conflicts of interest, covering the deleterious effects; however, the actors want to be involved in the network despite of these constraints. In SCM the non-positive features of the relationhips are – if not totally ignored – discussed in less detail. In general, the relevance of SCM is poor in explaining the various elements of the ties (such like actor bonds) between the network members.

SCM depicts a reality where one firm (actor) dominates over others in terms of technological exellence, capabilities, power or size. This is not always adequate in every network. SCM is a *rough* simplification of the reality; it has been typical within SCM-based analysis that the multiphase, sequential processes are simplified by means of concrete conceptualisation, which stems only from operational

settings. Often the major objective for the research is to find out the causes and consequences in the facility network. However, the role of single actions or events is not fully understood in SCM, especially if these events are triggers of change but the effects cannot be explained fully. For this reason e.g. Wilding (1998, 46) states that the chaos theory can explain some of the odd points in chain systems; namely the inevitable facts that '*a small change to an individual unit* (like a firm's single activity) *within a system* (like a supply chain) *may result in dramatic effects of the global system'.* As regards the chaos theory, it can be claimed that though the supply chain looks deterministic in practice, the reality is different.

The question of causality stems from the fact that SCM scientists accept implicitly the use of the SR-scheme and its mechanistic worldview in contrast to the network view, which depicts the reality in a more organic way. Theoretically, chaos can generate patterns as well; the pattern is just more or less stochastic by nature. More accurately, the network approach considers multiple events when the regularities are explained by addressing the non-linear pattern of processes. The outcome is thus less deterministic, implying an impressionistic interpretation of the reality. Among SCM practitioners there occasionally tends to be an illusion of managing the chains/systems totally.

Assessing the Quality of Research Work

This study contains papers that have rather theoretical or conceptual focus but also research work that relies on in-depth interviews with practitioners. The methodology utilised in the empirical research work is qualitative case-based analysis having parallels with the action-oriented approach. When assessing and judging the quality of the chosen research approach the following features can be identified (Yin 1994, 32-38, Ellram 1996, Garver and Mentzer 1999, 34, Nikkanen 2003):

First, construct validity: establishing the correct operational concepts to be studied; examining the degree to which a scale measures what it is intended to measure.

Second, internal validity: establishing a causal relationship; to what extent certain conditions are shown to lead to other conditions.

Third, external validity: establishing the domain to which the findings of the study can be generalised, or as Garver and Mentzer (1999,35) argue *'the*

degree to which the research findings can be generalised to a broader population' ; this often requires the use of particular protocol.

Fourth, reliability: demonstrating that the operations of the study - such as the data collection procedures, can be repeated with the same results.

Fifth, authenticity and resonance: the extent to which the research process reflects the underlying paradigm (compare to reliability and validity measures - this is one of the basic constructs in more social-oriented paradigms because of the fact that it is widely accepted that from the analytical point of view the research work should always be a reflection of the reality - in this sense the chosen methodology enables the researcher to find the basic constructs of the phenomenon that has been studied).

Sixth, rhetoric: the strength of presenting the arguments.

Seventh, empowerment: the extent to which the findings enable the readers (both scholars and practitioners) to take action.

Eight, applicability: the extent to which the readers can apply the findings in their own contexts (compare to the seventh assessment criterion)

In general, validity is more than the quality of the research work: it is a *portrayal of the entire working process.* In this sense it includes several aspects - or as Halinen (1994, 338) puts it - the whole process including '*the adherence to generally accepted scientific values, the internal logic of the study and the external applicability of its findings*'. Moreover, external validity is for assessing the *generalisability of the findings*.

New Steps in Logistics Analysis: the Grounded Theory Revised

Conventional logistics research is in a stage, where new methodological approaches are required to face the contemporary challenges (compare to Fig. 1). Because the network view (or views) is often deeply enriched by sociological theories (of social exchange *inter alia*), there is need to consider these theories from the methodological point of view. In this chapter the grounded theory is briefly presented and evaluated, emphasising its logic and its use as a coding protocol. The reason for this is that many features of this approach are utilised throughout the study. The basic constructs of the narrow grounded theory were often employed in the empirical and analytical dialogues with practitioners (see e.g. essays 1, 3, 5 and 6).

Generally speaking, a grounded theory is any form of sociological theory that is built up *gradually* from the *careful* observation of a selected social phenomenon (Jary and Jary 2000, 254). For a common, general grounded theory the following three targets can be manifested (Glaser and Strauss 1967, De Burca and McLaughlin 1998). First, the theory adopts a process perspective as opposed to a unit perspective; second, it positions itself as applicable for practitioners by taking a social psychological level of analysis; and third, it defines the research problem from the perspective of the focal actor. Regarding the different forms for utilising the method, two perspectives can be distinguished: the 'full', which is an approach that comprehensively utilises all the aspects of the grounded theory. Much of the grounded ideology is 'partial', which means that there is an iterative procedure in which data is collected first and then theoretized.

The grounded theory is not a specific method or a tight technique, as Strauss and Corbin (1998, 5) state: '*it is a style of doing qualitative analysis that includes a number of distinct features*'. Besides a broad methodological solution, grounded theory is a *coding practice* (Ellram 1996) in case studies, which implies a three-step coding protocol. This means that numerous researchers, when utilising some form of case studies, are in fact using implicitly and even unconsciously the coding procedure typical for the theory. The systematic coding procedure is included in the definition of general grounded theory, which is '*a detailed grounding by systematically and intensively analysing the data (...) of the (...) interview (...) by constant comparison. Data are extensively collected and coded (...) thus producing a well-constructed theory. The focus of analysis is not merely on collecting or ordering a mass of data, but on organising many ideas which have merged from analysis of data*' (Strauss and Corbin 1998, 22, 23). With the coding practice, the concept indicator is essential; it directs the conceptual coding of a set of empirical indicators (Strauss and Corbin 1998, 25). These indicators are the smallest units in interaction processes: the behavioural actions and events often described in documents or in the words of interviewees. A basic construct - *an activity* - consists of acts, or actions performed by *actors:* individuals on microlevel, or groups of firms on macrolevel, even alliances or other types of blocks between firms expose themselves in interactive processes.

Strauss and Corbin (1998) explain three coding protocols: open, axial and selective ones. With open coding the aim is to produce concepts that seem to fit the data; these concepts are mainly provisional by nature in a similar way as interpretations are tentative. In practical analysis open coding is the first data coding process associated with methods that 'break down 'case study data. Axial coding consists of intense analysis done around one category at a time. This should

result in more knowledge between that category and other categories/subcategories; it is essential to find and make connections among the categories developed in the open coding stage by searching for interactions and conditions. The selective coding method entails coding systematically for the core category; the researcher delimits the coding to only those codes that are related to the core categories (Strauss and Corbin 1998, 33). Undeniably, the coding practices, though often sequentially handled, should be more interactive than linear stages or phases from open coding to selective coding.

The core category thinking is essential because the entire grounded theory is based on the idea that the generation of theory occurs around core categories; the core category should capture the predominant behavioural aspects and patterns that are scrutinised - the main theme should be highlighted. In addition, the core category should comprise the main variations in human behaviour. Furthermore, this category is related to other categories that are analysed and explained. The core category should have clear implications for a more general theory (Strauss and Corbin 1998, 36). This idea is employed in various articles of this study, although the papers are concerned with organisational behaviour rather than purely human behaviour.

The use of the grounded theory as a coding practice requires the researcher to search for the core category with the help of coding by analysing and interpreting the smallest units of data, often word by word, sentence by sentence, or idea by idea. As regards the empirical part of some of the essays (e.g. 1 and 5), the researcher found it valuable that the interviewees were allowed to express and depict the reality by their own wording thus approaching the potential core categories. Besides semi-structures questionnaires, there were also some themes and some issues which were covered.

Generally speaking, the use of semi-structured interviews allows the interviewer to steer the direction of the discussions slightly. Besides, it gives the respondents options to express their *real* attitudes and opinions. In that sense, this method approaches the '*theme interview*', for which it is typical that the themes of the investigation are known, but the method does not require the use of constructed questions (Hirsjärvi and Hurme 1985). In logistics research there is often a sequential research procedure, which implies that *first* there is a model, theory, or hypothesis to be analysed, and *second* there are empirical facts on which the theoretical propositions will be subsequently *tested*. In this study, the target was to use an interplay and iteration between the theoretical proposals and ideas and categories stemming from *empiria* (see e.g. essay 2 for a discussion of iteration between theoretical propositions and empirical findings).

Evaluating the Limitations

There are some drawbacks in utilizing the case-based approach, which should be considered in order to assess the total quality of the research process. The following issues were found (theoretically, pragmatically) and are presented here to evaluate the consistency of case-based research work in general.

First, the question of generalisability is problematic, as it is difficult to employ the results in context that differs substantially from the original one. The applicability should be assessed in a comprehensive manner if the other settings do not have strong parallels with the context that was in focus in the first place.

Second, lack of an appropriate and well-documented research protocol created *a priori* and evaluated *a posteriori* can cause significant problems e.g. in the coding phase.

Third, as regards the construct validity, the interactive nature of interpersonal/organizational issues (in conjunction with the network view/s) can reduce notable the utilization of the results and research outcome. Therefore, the poor applicability is not due to the limitations of the case study methods as such but also because of the different theoretical underpinnings (classical SCM analysis aims at reducing the reality with mechanistic causative schemes).

Fourth, there might imbalance in the presenting the arguments and the outcome of the research work in reports and written documents due to intentional interpretations, which are guided by the subjective values of the researchers. Excessive stress on empowerment in relation to more rational and scientific argumentation can misdirect the researcher in his/her attempt to manifest the conclusions of the study.

Fifth, the language *per se* can be an insufficient carrier of truth. To reduce this problem, the researcher can try to avoid some of the problems attached to this by using and testing deconstruction; this means that the researcher is unintentionally encountered by socially institutionalised rhetoric (which is even an urge for managerially-oriented scholars). Deconstruction aims at revealing the ambivalence and incongruousness of texts, which can only be understood in relation to other ones.

Sixth, it is one of the most prominent questions for the researcher to what extent – and how critically – he/she recognises the underlying paradigms of the theories and their impact on the primary issues of the research work

(beginning from the basic assumptions); the acknowledgment of the metalevel influence is needed prior to in-depth analysis and subsequent re-design of methodological selections.

Seventh, the question of repetition is always problematic when the research methods need sensitive interpretation and open coding; there might be pre-defined analytical categories which may mislead the researcher in his/her orientations in e.g. practical interviewing situations. Also, researcher can create unobserved skills in 'overacting' and 'overinterpretating' the responses and data at various stages in the research work.

Eight, in spite of attempts of using sensitive methods, it is still very difficult for the investigator to grasp the subconscious mind of informants particularly if interviews are employed as an instrument for gaining deeper perceptions. There are huge variations of human behaviour (determined by different motives), which are very difficult for informants themselves to handle; some parts are more likely to be unattainable.

Regarding the classical asking-answering way of communication in interviews (which means the use of the actor-reactor -scheme in pragmatical analysis), New and Payne (1995) are of the opinion that getting reliable data requires more than just simple asking. Besides, the most interesting questions are often the most difficult ones: the motives behind personal behaviour, e.g. on what basis the information is actually filtered, can be hidden and latent for the informants themselves.

An intensive interviewing method requires a sensitive and interpretative way of communication to ensure the reliability of the research. This means that occasionally the researcher is obliged to do interpretations already when the interview is on-going – not after the session. Besides, the researcher should be capable for modifying the range of relevant, flexible, and situation-oriented questions in every phase of the process in order to ensure the validity of the investigation. This is an imperative, e.g. if the informant cannot conceptualise the ideas with his/her own vocabulary. Hence, there is need for perpetual observation during the negotiation using also debriefing, if required. Thus, occasionally the interviewer has to specify the comments and narratives of the informants in order to guarantee unanimity in the meaning of the expressions. Nevertheless, the researcher, with the help of an open dialogue, should always aspire to support and encourage speaking rather than compel the respondents to use certain idioms and phrases. The researcher should have an urge to create an atmosphere where the commentators should hesitate to reveal critical notes, if needed. In

general, the atmosphere should be emphasised in the discussions because it is an assurance for a high degree of motivation.

One of the factors that can cause problems in studies is that a certain type of managerial, well-established wording (and inherent concepts) might mislead the researcher, as the conclusion can be predicted – more or less – and is consistent with the predefined hypothesis because of the formulation of questions, indicating a What-You/U-ask-is-what-you/U-get (WUAWUG)- syndrome. To reduce this kind of risk, Alajoutsijärvi and Erikson (1998, 34) have proposed a method of microlevel stories to elaborate the reality on every managerial level. The methodology is based on constructive science and is suitable because reality is a compilation of perceptions assessed by all the actors exposing themselves in an exchange process: the actors can be individuals, or firms.

As regards informal comments, there are some analytical problems. These comments, though often very valuable for the understanding of the phenomenon, can not be included in the analysis. Presumably, some of the informants do not want to unveil all the facts for strategic reasons or because the bundle of their personal motives can be difficult to handle. Inevitably, this could partly reduce the reliability of the research work.

On the other hand, many of the facts are clear and subject to open disclosure, increasing the reliability of the entire research work. The question of divulgation is always problematic, if interpersonal (also difficult) issues are to be analysed. It is also worth noticing that the appropriate vocabulary can not just limit but also enrich the empirical investigation. The greatest risk is whether the researcher has true capabilities and skills to interpret correctly and promptly the material gathered from the *empiria*. Often, as in some of the papers in this publication, many of the ideas and definitions were created with the help of preliminary discussions; hence the risk is reduced, though can not be totally eliminated.

One of the problems is the efficient use of retrospective data, as the researcher often aims at including the temporal dimension in the analysis. The respondents are often familiar with describing the history of the on-going relationship/s by addressing the critical incidents. The temporality is for assessing the notable changes in the state of a relationship: for example technological adaptations, interorganisational cohesion, the evolution of stronger bonds, and features of network dynamics. In the longitudinal analysis, the interviewees have a chance to catch those events which have been decisive for their own behaviour. However, respondents are often very reluctant to give detailed narratives in this issue. This is partly due to the fact that networks are a result of a very stable and innocuous

progress, carrying out quite strong internal rules and norms. On the other hand, the identification of causality in e.g. decision making is very difficult to a large number of participants on different managerial levels.

Structure of the Study

The present study is a compilation of an introductory part and nine scientific research papers:

Essay1: Nikkanen, M. Creation of Networks through Interaction, Relationships and Nets

Essay 2: Nikkanen, M. Contribution of the Industrial Network View for Analysing Supply Chain Management (*Paper presented in the 13th Working Seminar on Production Economics, Igls/Austria, February 2004)*

Essay 3: Nikkanen, M. The Different Roles of the Railcarrier in Intermodal Freight Transportation Network *(Paper presented in the 13th IMP Conference, Lugano, Switzerland, September 4-6, 2003)*

Essay 4: Nikkanen, M. Analysing Intermodal Freight Transportation through the Roles of the Operators: Case VR Cargo (*Paper presented in the annual NOFOMA 2004 Congress, University of Linköping, Sweden, June 2004)*

Essay 5: Nikkanen, M. Generation of Supply Networks through Sub-nets (Paper published in the Proceedings of IPSERA 2004 Conference, Catania, Italy)

Essay 6: Nikkanen, M. Means of Handling the Negative Effects of Network Engagement in Structurally Bonded Nets: Initial Empirical Evidence *(Paper accepted to be presented in the 14th IMP Conference in Copenhagen, Denmark, September 2004)*

Essay 7: Nikkanen, M. From Interaction-based Approach to Dialectical Confrontation: Some Theoretical Proposals for Analysing the Consistency of Dissentient Interorganisational Relationships *(Paper presented in the 15th Annual IMP Conference, Rotterdam, the Netherlands, September 2005)*

Essay 8: Nikkanen, M. Spatial Concerns in Logistical Networks with Special Reference to Proximity *(Paper presented in the 15th Annual IMP Conference, Rotterdam, the Netherlands, September 2005)*

Essay 9: Nikkanen, M. Common Carriers in Intermodal Rail and Sea Transportation Networks: Preliminary Empirical Evidence *(Paper presented in the*

Annual NOFOMA 2005 Congress, Copenhagen Business School, Copenhagen, Denmark)

The papers are summarized below.

In **Essay 1** there is a theoretical description of interaction, relationships, their dimensions, and major interorganisational processes on multiple managerial levels as well as their outcomes. One of the most important objectives of this essay is to reveal those conceptualisations which are not explicitly explained in the SCM -based approach and which are needed to understand the logic of the nets and networks that is often applied in this study but rarely discussed in details. From analytical point of view it is of great importance to find out the major managerial levels, including how the relationships are conceived through the interaction processes (exchange, adaptation, coordination). Finally, a synthesis is made by combining the levels of interaction, the dimensions of the relationship creation procedure and the outcome of the interorganisational processes.

Essay 2 sheds light on two distinctive approaches in understanding modern logistics for analyzing networks. It is assumed that the interaction-based network view (particularly according to the IMP-based interpretation) and the managerial view (represented by traditional 'managerial' Supply Chain Management) differ in some major features, which are even ontological by nature.

There are some pitfalls in employing SCM: e.g. it depicts a reality where one firm (actor) dominates over others in terms of technological exellence, capabilities, power or size, which is not the case in complex networks with multiple players and an abundancy of business relationships; also in empirical analysis, SCM often addresses the higher managerial levels, emphasising their decision-making. In the essay it is claimed that much of interorganisational behaviour tends to be interpersonal, taking place on lower managerial levels, and being influenced by social structures. One of the key proposals is that in SCM the examination often relies on classical modelling (the hypothetic-deductive approach in the analysis and the mechanistic stimulus-response/SR- scheme) accompanied by an urge to trace practical strategic benefits. In the industrial network view, in turn, the theory is based on interaction between the actors in general; the actors can be firms or human beings. Theoretically, in the industrial network view the grand view of human interaction relies on the idea of interaction in contrast to considering actions and reactions (proactive and reactive measures respectively) as responses, as implicitly presumed under SCM. Through the industrial network view, the logistics research is enriched by the proposals, concepts and ideas created in social sciences, and more particularly in the social exchange theory.

This particular theory can contribute to the development of SCM -based thinking, especially when interfirm cohesion is under scrutiny, by highlightning the behavioural aspects of interorganisational collaboration.

Essay 3 contains a description of various roles of a railcarrier in a particular logistical system - Intermodal Freight Transportation (IFT) network. It is suggested that the interorganisational roles appear distinctively on a dyadic level or net(work) level. Basically, the study exploits the idea of interaction by addressing the behavioural aspects of the network operators and employing a certain typology: either the focal firm deals with one counterpart (implying a dyadic relationship) or the focal firm exposes itself to a range of relationships with all the members in a network. Also the question of the major nature and character of the actions, reactions, and interactions as responses in general is discussed. In the study one particular network role – that of a common carrier – is particularly specified and analysed. On the basis of the results of this study, a more detailed in-depth analysis is proposed to clarify the details of the different roles, especially with respect to major behavioural indicators.

Essay 4 proceeds with the themes of essay 3. In this paper it is discussed to what extent the roles adopted by the focal firm – a railcarrier - delimit the scope of behaviour, enforcing them to take care of the traction of wagons in transportation chains attached with some minor augmented service. Especially in IFT, which is presumed to account for a greater deal in contemporary value chains for moving unitised goods, there are lot of impediments for successful growth because of the inter-firm roles, which appear either on the net(work) level (besides the common carrier also the dominator) or on dyadic level (subcontractor, partner, principal). The network role of the common carrier influences strongly the other identified interfirm roles. The existing network structures, structurally bonded relationships and even inertia influence the strategic decisions made by the railway companies in freight transportation. On the other hand, legislative constraints form an impediment for new activities. In Essay 4 it was found out how the interorganisational roles and structurally bonded nets tend to constrain some of the activities performed by the actors.

Essay 5 approaches supply networks from a structural point of view. It is assumed that the boundaries of the supply network are rather blurred than clear by nature; a supply network is actually a constellation of identifiable sub-entities defined as nets. A net is defined as a limited set of actors that can be based on a firm's interpretation of appropriate relationships. It is also proposed that the net can be geographical, having limited geographical coverage, or technological, where the common technology is the major tying element between the mem-

bers. A triad is the smallest net theoretically possible, as it covers both direct and indirect relationships between three actors. Value nets and strategic nets as expressions on actors' intentions, and expectations are also presented. This paper contains a theoretical and an empirical part. In order to test the relevance of the suggestions in *empiria* by revealing the nets, a single-case study has been conducted.

In **Essay 6** special attention is paid to structurally bonded nets (compare to the content of Essay 5 as well). It is claimed that a network engagement contains both positive and negative effects for an actor. In this essay the main objective is to introduce, both theoretically and empirically, responses for the negative aspects of network presence. In order to understand more deeply the non-desirable consequences, particularly conflicts should be analysed more deeply on every identifiable network level. Conflict is a strong disagreement on a certain, specific issue, leading to substantial problems in the relationship/s either on dyadic (focal company *vis-à-vis* an operator), triadic (in case of intervention from a third party's side), net (e.g. focal or social net) or network level. In this article, a conflict is also regarded as a deep collision of interests in multiple relationships, causing tension and need to consider appropriate methods for reducing the stress of incompatibility. The actors can also deploy and spread some of the effects over the other network members. An unsolved conflict as a form of deep disagreement can lead to a total dissolution of a relationship, although in a structurally bonded network the risk is considerably low. In the empirical analysis based on subsequent, sensitive interviewing sessions, it was found out that the focal company of the study had a limited behavioural scope in the context of the study to reduce or eliminate interorganisational stress and to avoid open clash in the network.

The main objective of **Essay 7** was to expand the horizons of network view/s. The aim was to describe an idea of dialectical approach for understanding the conformities of interorganisational behaviour, by employing a way of thinking in which adversarial, dissensual and consensual features in interorganisational relationships and subsequent processes are sharply contrasted. In this essay it is proposed that a network as a set of diverse relationships can be characterised by dialectical means, exposing the opposite-driving dimensions. In the study, three approaches to discuss relationships (managerial, network-based and dialectical) are presented and compared. It is assumed that the dialectical approach (despite of its dualistic nature and polarising concepts) can extend the analytical scope by introducing new conceptual vocabulary and by grasping displeasing issues, which are often neglected in relationship studies.

From the empirical point of view, this requires sensitive methods to face the subconscious elements of the relationships, which are influenced by interpersonal contacts. To avoid analytical narrow-mindedness, besides discussing the positive sides of a relationship (e.g. trust and commitment, open communication and mutual respect in focus), the researcher should not only consider the problems of one particular relationship (lack of communication, competition and dispersed interests), but also pay proper attention to the extreme features as well, which seem to affect the way the actors truly perceive the relationships.

In order to discuss deeply the interorganisational issues, a discussion of space and proximity is required emphasizing the closeness-remoteness -continuum between the network actors. In **Essay 8**, some aspects of space in logistical networks are discussed; especially distance as a reflection of spatiality is scrutinised. The theoretical contemplation is complemented with preliminary empirical analysis of transportation industry and networks. Because networks as metaphorical conceptualisations have very strong geographical aspects, it is necessary to link the question of spatiality - e.g. interorganisational proximity - to network analysis. It is argued that spatio-temporal aspects constitute even some ontological features in network analysis as they give valuable conceptualised tools for comprehending the diversity and complexity of networks. The significance of embeddedness in network studies also means that the spatiality should be deliberated, as embeddedness can also be interpreted as involvement in local or close dyadic and network relationships. In this article distance equals to interorganisational friction as presumed in literature, though often implicitly expressed (e.g. impedance, inconvience) and it can be an expression for studying the proximity between the actors. Conventionally, the Newtonian-based interpretation of interaction has dominated the logistical analysis with strong focus on gravitation, aggregate type of modelling and analysis of adequate distance measures (time and cost distance). One of the major propositions of this essay is that with the help of extensions for assessing and measuring interorganisational interaction and its frequency, new types of correlations and interpretations can be formulated to describe the proximity and closeness-remoteness- axis between the participants of logistical networks. It can be also suggested that the social distance measure (influencing how time and cost distance measures are perceived and interpreted by the actors) seems to be more important when interorganisational proximity is discussed and analysed in logistics networks.

Finally, in **Essay 9**, the issues of the network engagement are returned by means of discussing interorganisational roles. As already noted in essays 3 and 4, common carrier is a typical role for many transportation companies in net-

works. The term common carrier has, however, many connotations in freight transportation systems, depending on the context where it is applied, though mostly it refers to a juridical interpretation. In this study the concept is approached differently, as the main objective of the paper is to discuss and compare the role of the common carrier (represented by a chosen focal actor in empirical analysis) in intermodal freight transportation (IFT) networks.

A bi-faceted and dualistic interpretation of the role-position concept provides a robust analytical basis for the study. The network-based approach as a theoretical suggestion with strong emphasis on interorganisational issues (complementing the conventionally used normative and strategical/operational approaches) is strongly addressed. The analysis is based on preliminary theoretical presumptions related to empirical findings and comparison in the Finnish railway systems and liner shipping industry. The study shows that particularly in the railway industry the common carrier as an organisational role tends to have some typical characteristics, such as the executive's intention of expressing its strategic will openly. The railcarrier often aims at being truly neutral towards all the other operators. In pricemaking policy the principle of cross-subsidization, which is based on the idea of stability, ensures the continuity of neutrality. In liner shipping industry, some of the features – also as reflections of neutrality - are assumed to be valid as well, to name the liner freight making policy and its stability, which also implies non-discrimination between customers. One of the key findings is also that in liner shipping industry the classical normative approach (referring to the influence of international conventions in practices) still dominates the examination, though the network-based approach could enrich both the theoretical and the empirical discussion.

Network Perspectives

In this study both nets and networks are under consideration. It is also assumed that the network view gives a researcher different perspective for discussing the conformities on modern logistics systems – like transportation or supply chains. In this chapter some features of networks are explained; this is needed to understand the scientific orientations in many articles.

The network is actually a *metaphor:* particularly in logistics a network has conventionally been defined as a set of connected nodes and links. In infrastructural networks the nodes are points of origin or destinations, or intermediaries between links, having some functional character like warehousing, loading, or dis-

charging. The links are the connecting elements: roads, seaways, tracks, communication, and information linkages to name some of them. In this sense they are the facilities for the movement of goods and information. The network as a social structure consists of social and other relationships between the partners; between nodes which are e.g. individual persons or groups of people working cross-functionally between organisations. These *'human nodes'* are regarded as actors. This implies that a network can be defined in a general manner as set *of relationships between the parties*.

There are different approaches to the network perspective. The classification of the network research tradition can be categorised as follows (Kamann 1998, 62, Törnroos 1997, 616,617):

- studies of community elites and related items, such as social support by social sciences, for instance the social exchange theory; social constructs and behaviour on interfirm level; social networks,
- regional science with studies on industrial complexes (referred to as the milieu, as pointed out by Cova *et al*. (1998), Castells (1996), Capinari and Kamann 1998); regional networks,
- research in industrial marketing with the main interest in the seller-buyer relationship, industrial networks, in broadest sense also value chains; and contractual issues under consideration; and
- research in physical networks including the infrastructure in traffic, spatial interaction, the optimal routing with deeper analysis of bottlenecks and barriers; infrastructural networks and technological nets.

In the discussion on different industrial networks, Andersson et al. (1994, 229, 230) employ the term 'business network', which is 'a set of two connected business relationships, in which each relation is between business firms that are conceptualised as collective actors'. Often, however, it is a necessity that both business and non-business relationships are scrutinised, since it is assumed that the former relationships are influenced by the latter. Often, although indirectly, the stakeholders' decisions (e.g. in terms of basic investments to transportation facilities, nodes and hubs) have a remarkable influence on one actor's ability to accomplish the business missions. Spatiality is connected with networks in the form of the milieu, which has a special meaning. It is termed as 'a spatial set, which has territorial dimensions but no predetermined border' (Kamann 1998, 63). Accordingly, the term milieu combines the ideas of a local net and/or focal net.

Coupling the infrastructural analysis with the ideas of the social network theory, a definition of a particular network is reached; that is '*a network is a configuration of facilities between nodes allowing the entities to interact between the nodes'* (Kamann 1998, 66), where

facility = link, tie, relation, or connection,

node = origin or destination at a facility (nodes can be either physical nodes or human actors), and

entity = good, vehicle, container, service, information, or power.

The description of Kamann (1998) is in accordance with the most applied frame for depicting networks as systems. As stated above, in conventional network analysis systems are defined through nodes and links. Accordingly, the link is a physical facility for moving goods with vehicles. Extending the traditional perspective, for Kamann also the relation can be a facility.

Operationalising the term entity can be difficult because it is not easy to create a direct linkage between the wordings of social sciences (like power or control) to tangible factors without a radical change in the analytical approach. Nevertheless, the value of the conceptualisation by Kamann (1998) is in the comprehensive packaging of the two main components: the social (human) and physical (infrastructural).

As noted above, in the logistics science the network analysis is conventionally based on two profound components between nodes: the physical flow of goods and the information flow attached. In order to deepen the analysis, the basic constellation has to be supplemented with non–traditional ingredients, which thus requires a combination of attributes (the entities) from social sciences (power, role). In addition, an evaluation of connectors – such like links, ties, or bonds - is needed in order to understand the cohesive forces and determinants of the network structure. For this reason actor bonds and other tying elements are identified and analysed more accurately.

As regards the Scandinavian network research representing the industrial network view, there is an abundancy of examples of successful use (e.g. Woxenius 1998 in intermodal context, Andersson *et al*. 1994 assessing the dyad in the network). The theoretical background is derived from the IMP-Group's pioneering work (Ford *et al*. 1998). Though there are a lot of differences in details, the researchers share the same theoretical background also on the metatheoretical level, although metatheoretical thinking is not explicitly embedded with these

theories. Typical for the Scandinavian research is that it relies on the subjectivity and context boundness of reality and knowledge, both in business and research situations. There is also emphasis on benevolent, co-operative behaviour aiming at mutual goals, which seems to refer to an intentional, voluntaristic view of human nature. Moreover, reliance on the subjectivist focal firm's view on its own business context is important, as well as general interest in understanding the dynamic processes related to various complex, fragmented and textured network contexts (Tikkanen 1997, 595).

The network approach (or paradigm) is not a consistent entity, but absorbs ideas from various sciences, mainly from the social exchange theory; on the other hand there are plenty of different network views as well. When constructing a taxonomy for network studies, Araujo and Easton (1996, 68) analysed several disciplines and subdisciplines like sociology, organisation theory, social policy, innovation studies, political science, industrial marketing and purchase, economic geography, entrepreneurship studies and comparative studies of economic systems. They claim that the social network approach has been a precursor to all the other approaches. Consequently, the IMP-based approach has been influenced mainly by the social exchange theories, thus stressing the social networks in the nets/networks.

Tikkanen (1996a) notes that the Scandinavian tradition is more sophisticated and sensitive for (post)modern research compared to the explanations created by management -oriented scholars. In the American tradition the main focus is on the strategic network approach with one firm as a dominator, establishing and governing the hierarchical system (compare to the SCM analysis by Cooper *et al*. 1997, Cooper and Ellram 1993 and Mentzer *et al*. 2001 with the same kind of assumptions: channel integration is initialised and led by one leading and controlling firm vs. the voluntarism and joint-governance in the IMP-based analysis). In the network creation procedure it is not possible for one firm to control continuously the entire system of co-operative actors working together.

Use of Metaphors

As mentioned in the previous chapter, network as a scientific concept is a metaphor. Despite of the fact that there is a debate about using metaphors in general among scientists, the network approach employs the idea of metaphorical thinking strongly. As mentioned, even the core concept of this study, the *network,* is more or less a metaphor in a similar way as related terms, as '*markets as networks*' (compare to the dualistic perspective suggested by Williamson 1986:

markets and hierarchies linked to governance of interfirm activities). Axelsson and Easton (1992, 56) accentuate that a network is actually '*a model or metaphor which describes a number, usually a large number of entities, which are connected*'. Even the basic constructs of the network theory are metaphorical by nature; besides '*networks as relationships*', '*structures*', '*processes*' and '*positions*' have the same connotation as well (Easton 1992,4).

The importance of metaphors is *twofold*: *first,* it is essential for further analysis to identify and understand the meta-theoretical roots of the theory that will be utilised. In an actor-based analysis, besides general understanding of the regularities, the analysis of the metatheories/y is even a prerequisite (Tikkanen 1996b, 41) before the intensive working process. With the help of an axiom, which is based on a relevant metaphor (like markets as networks), the researcher is obliged to face certain metatheories as well. Subsequently**,** the analysis, including the use of appropriate methodology, relies on these axioms whether they are relevant or not.

*Second***,** it is assumed that a chosen metaphor *hides as much it reveals*. This point is essential for logistics research, because in infrastructure-based network analysis the use of nodes and links has been a convention. Nevertheless, it should be pointed out that this assumption can be even misleading. As regards logistics networks, e.g. in intermodal freight transportation many of the obstacles and problematic situations (and costs as well) are connected with modal interfaces. The rejection of the two-component model - links and nodes only - and replacing it e.g. with a *nodes-interfaces-links*- proposal can be adequate if the relations are to be scrutinised in a more detailed manner. Thus, a chosen metaphor can be a constraint or a catalyst for pragmatical analysis.

The game metaphor has been utilised explicitly by some scholars, e.g. Håkanson (1992, 130,131), when explaining the interaction and evolution processes in industrial networks; the chess game analogy has been used to highlight the critical points in network development. In a quite similar way the processual development has been described by Wilkinson and Young (1997) by using a dancing metaphor: the first of the examples is a conventional win-loose explanation and a later a win-win portrayal. Furthermore, one of the most typical arguments for deeper collaborative arrangements is to address the metaphor of the *win-win game* especially in partnership studies. This can be connected with synergetic effects as well. It seems that numerous scholars - at least theoretically - accept the win-win situation if a stronger relationship exists between the parties involved. However, Castells (1996) is quite sceptical when discussing this idea: he points out that for a networked society in general '*the losers pay for the winners*'

(op.cit., 472). This implies that a zero-sum game is resulted under many circumstances in the modern world.

Many of the studies with a managerial approach have several features that tie them to the metaphorical group of analysis. Bleeke and Ernst (1995) have evaluated alliances between different participants using the strengths of the operators as the key elements, with special attention to the relative bargaining power of the partners. They present six types of alliances:

- collision between competitors (mostly short term and failing to achieve strategic goals),
- alliances of the weak (mostly failing followed by either a dissolution or acquisition),
- disguised sales (rarely lasting due to unequal power of partners),
- bootstrap alliances (again rarely working),
- evolution to a sale (two powerful participants but the bargaining power shifts during the co-operation process), and
- alliances of complementary equals (two strong and complementary partners).

The last of the above types, a marriage type of relationship, is often the most long-lasting, even though the partners (often because of the compatibility) have different functional strengths. A challenge for the parties is to construct adequate control systems and governance on the one hand and enough flexibility on the other hand. In this sense the issues are close to the network approach. Inevitably, these kinds of suggestions affect the explanations on the interorganisational roles as well.

A presentation of new adequate metaphors can change the analysis as well; e.g. Alajoutsijärvi *et al.* (1998) have explored the metaphors in order to enrich the scientifical discussion with some new metatheoretical proposals. By analysing some of the most commonly applied metaphors such as '*network is a marriage*' and '*network is a business system*' (compare to the wording employed by Gummeson (1998) - '*society is a network of relationships*'), they come up with new kinds of metaphors. Accordingly, the emotional-alike aspects in the networks as well as in the explanations could be worth discussing.

Concluding Discussion

Modern logistics analysis is faced with the obligation of grasping broader perspectives. The network-based analysis with an idea and logic of interaction can steer the research orientations.

Due to epochal shift, several network features can be depicted as consequences of contemporary times, e.g. interorganisational resource dependence, fragmentation of larger industrial networks into smaller co-operative nets characterised by efficient interaction, and the complexity of interorganisational actor bonds, activity links, and resource ties (Tikkanen 1996a, 593, Tikkanen 1997, Cova 1994, 278, Cova *et al*. 1998). Because of the fact that the social exchange theory has so much benefited the network theory, some researchers (Cova 1994, Tikkanen 1997) argue that actually hierarchical is a modern term referring to the past (managerial views), while networking belongs to the future.

Cova (1994, 280) underlines the importance of social behaviour and processes when interorganisational issues – like convergent and divergent processes – are to be studied; he even claims that some of the researchers can be classified as representatives of sceptical postmodernism for whom reality is a pure illusion, which implies that everything is intertextual, not causal, or predictive; others are affirmative scholars, for whom the reality is constructivistic or contextualistic. For some scholars postindustrialism (or postmodernism) represents the ideas of contemporary thinking, which means e.g. that not just nets and networks but also entire societies can be regarded as networks (Tikkanen 1996a, 1996b, Castells 1996, Cova 1994). Tikkanen (1997) argues that in its extreme form postmodernism is even an 'anarchistic' approach. Because of the various views, Cova (1994) calls for pluralism to explain the different perspectives which are in interplay and complement various perspectives. In a pluralistic view of the world, not just a range of applicable definitions and concepts exists, but also interpretations. Coherent pluralism means that there is a convergence of thinking but no leading paradigm. Hence, it is important to understand the implications for the research work because of different worldviews. A researcher should be deeply conscious of the theoretical underpinnings of the theory that is applied (Tikkanen 1997, 83, Gummeson 1998). This is particularly required in logistics analysis in which there has been a long dominance of managerial views (often represented by the DSCM model) over the others.

Approaching actor-based analysis (and its worldview), contemporary logistics research is likely to be enriched by the proposals, concepts and ideas created in

social sciences, and more particularly in the social exchange theory (e.g. role, position, power, embeddedness, identity, interaction, conflicts and divergence). In the managerial (or strategic) 'paradigm' the examination relies still more on classical modelling (hypothetic-deductive approach and mechanistic SR-scheme) attached by an urge to trace practical strategic benefits.

In the set of the scientific papers forming this study complementary features are discussed and analysed; the logic of nets and networks is different than in traditional supply chains.

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Essay 1

Creation of Networks through Interaction, Relationships and Nets

Introduction

In this essay, the nature and formation of *relationships* are discussed. Created through *interaction,* they are the key elements in understanding the consistency of every network. It is of major importance for in-depth research to link these two generic terms and discuss how relationships are actually generated through interaction. In the model created by the Industrial Marketing and Purchasing Group (IMP), four basic elements are present to depict the major determinants of the explanation of relationships: the interaction process, the interacting parties (organisations and individuals as actors), the interaction environment, and the atmosphere (IMP Group 1982, reprinted in Ford 1997).

An interaction process is a major operational tying element between diverse organisations, causing relationships. Furthermore, in the long run, adaptation and institutionalisation have an impact on the relationships as well as on the atmosphere; besides co-operation and closeness, also power and expectations have an influence on the atmosphere. It consists of conflict and co-operation (Easton 1992, 14). Atmosphere is thus a result of interplay between two opposite forces; it is resulted in the *'power-dependence relationship which exists between companies, the state of conflict or co-operation and overall closeness or distance of the relationship as well as by the companies' mutual expectations'* (Easton and Araujo 1992, 69). Hence, the atmosphere is not influenced only by conflict and co-operation but also by competition. A conflict results if hostile and destructive competition or a dissatisfying dyadic relationship is perceived. Competition, on the other hand, can later lead to certain co-operative arrangements like partnerships. Regarding the environment, the market structure is one of the features that have impact on the relationships. Although widely applied e.g. by scholars in

marketing, interaction, relationships and nets have not raised remarkable interest in logistical analysis.

Interaction Causing Relationships

Basically, the analysis of the content of interaction is faced by a multitude of dimensions.[1] Besides relationships, also episodes can be identified. Episodes are mainly transactions in a short term, whereas a relationship denotes more long-lasting collaboration between partners. An episode is a short term sequence of acts.

Episodes are interconnected but identifiable actions, whereas interrelated episodes are sequences. The episodes are later gathered to relationships between the partners. Regarding services, the entire interaction process can be divided into three components, *acts*, *episode*s, and *relationship* (Grönroos 1997, 9). The act is the smallest unit for analysis; acts are related to interaction elements (in practice e.g. information or physical goods). Holmlund (1997, 96, 97) has enhanced the dichotomous IMP classification (episodes-process) by proposing that the most detailed type of interaction is actually *action,* not act.

According to Håkanson and Snehota (1997, 45), a relationship is a '*mutually oriented interaction between two reciprocally committed parties'.* This means quite a dynamic view of a relationship. Thus, a relationship is developed over time, having past, present, and future dimensions. In addition, relationships are rather consequences or outcomes, because of the common history. In the network view, which explains the relationships in an organic way (as according to the IMP Group), it is possible that they often just happen. In logistics the use of Supply Chain Management (SCM)- based analysis leads often to the assumption that relationships are intentionally created because of strategic decisions. Thus, planning the nature and pattern of relationships in advance is inadequate, or as Holmlund (1997, 6) postulates '*relationships are not determined a priori*'.

[1] When evaluating the complexity of interactions, Ford *et al.* (1998) discuss several aspects of interactions with four key concepts: capability, mutuality, particularity and inconsistency

When interacting, the parties have intentions and they make interpretations of the interaction (Ford *et al.* 1997, 57), which means that they give meaning for the details while interacting.[2]

As noted above, a relationship refers to quite a long-term commitment, whereas interactions represent the dynamic aspects of relationships. Hence, interaction as a term '*comprises the exchange processes and adaptation processes*' (Easton 1992, 8). These two major interorganisational processes are often added by some others like institutionalisation (Håkanson and Snehota 1997; in their wording, however, institutionalisation is very closely matched with bonding) or co-ordination (Möller and Wilson 1995). Occasionally, adaptation refers actually to adjustments, which are more short-term notions (Holmlund 1997, 1998).

A firm has a portfolio of relationships which it can actively develop. The relationships between actors can be direct or indirect; these two dimensions are essential to understand the variety of relationships between firms and the creation of networks, as well. Also the quality aspect can be added to these two dimensions: the relative importance of direct relationships can be greater than that of others.

Primary Interorganisational Processes

Exchange

As indicated in the previous chapter, interaction includes two major processes – exchange and adaptation. In this chapter the contents of these two attributes are discussed briefly.

The word exchange is associated with interaction in general business rhetoric. The interaction in relationships '*comprises processes of exchange including business, information, and social exchange*' (Salmi 1995,27). In this sense information is more impersonal, official, and even normative by nature. Information

[2] Holmlund (1997) has constructed a model for analysing the perceived relationship quality (PRQ) between network partners. When the actors are assessing the perception, a certain amount of outcomes is needed in order to make an analysis. The analysis explained by Holmlund (1997) has similar ingredients as the suggestion by Thibault and Kelly, when as they construct a variable Cl alt to depict an outcome. This has later been utilised by several researchers within a dyadic relationship (e.g. Han 1997, Anderssen *et al*. 1994) or between channel members (e.g. Andersson and Narus 1990, Salminen 1997); Cl alt can be defined as a standard that represents the overall quality of outcomes (economic, social, and technical) available to the firm from the best alternative relationship.

exchange is mainly based on legal contractual commitments between the actors, though non-contractual ties tend to be important as well. Furthermore, the chosen technology affects the information exchange. The social side of exchange is seen as a bundle of societal processes on *different managerial levels.* There are four elements which are exchanged: product or service, information, financial exchange, and social exchange (IMP Group 1982/1997, 9).

The ontological term exchange is not explicitly embedded in network thinking; the concept stems from various other scientific disciplines. In a single economic transaction exchange is understood by economic and/or business means. In the network approach, however, the term is dedicated to a range of dimensions and aspects. Besides economic and business exchange, social, information, technological, and even political exchange are stressed. As such, the concept of exchange can be associated with the concepts bonding or activity link, as explained under the network approach (Olkkonen 1998, 506)

Particularly in the marketing literature the concept of exchange has mainly three main dimensions: the exchange paradigm is established on discrete transactions, on hierarchy (as explained in the TCA approach according to the Coase-Williamson theory), or on relationalism (Olkkonen 1996, 140). Of these paradigms the first is a simple and impersonal transaction mainly based on price. The third has exchange relationships as the focal point in a series of transaction episodes. This means that two dimensions (pure transaction-exchange relationship) are the ends of a continuum.

Contrary to the above, Grönroos (1995) dislikes the use of the simple concept of exchange because it gives quite a narrow view and is even contradictory by nature. He distinguishes between two terms instead: exchange as a short-term notion and relationship as a long-term notion '*implying an association of two parties*' (op.cit.,13). Furthermore, value can be even more important than exchange and - as Grönroos (1997, 16) states - the value is '*embedded in the exchange*'. Accordingly, it can be assumed that it is possible to have value adding relationships without transactions or even exchange. Hence, the value of a relationship *per se* can be high enough for the actors; they can be defined as fundamental resources. When relationships are established, investments as well as maintenance are required in order to eliminate a possible dissolution.

As regards social exchange (e.g. in focal nets), both utilitarian and non-utilitarian motives are presented by Cova (1994). Accordingly, a continuum of exchange forms can be expressed, starting from pure exchange with discrete economic exchange, to pure gift transactions in which no economic expectations from the

other party are required (for more details see op.cit., 291-292). Because of the fact that the network theory has absorbed theoretical impressions from other sciences, mainly from the social exchange theory, also the concepts of trust, commitment or co-operation are often in focus (e.g. Anderssen *et al*. 1994). The importance of exchange for the relationship is twofold: it is an essential ingredient in the perceived satisfaction and it is an element in the constellation in which the determinants that lead to higher satisfaction are assessed. Furthermore, trust leads to more co-operative activities and later to higher satisfaction. This has been noted e.g. by Andersson *et al.* (1994, 19), when they claim that relationships are heavily influenced by interaction between the actors, including the nature of the exchange. The conclusion is, thus, quite evident but maybe not fully explained in simple interaction models. Because of this e.g. Håkanson and Snehota (1997) require more analysis with strong concentration on the time element in related studies.

Adaptation

Besides the exchange and co-ordination processes, also the adaptation processes between the partners are of major importance; adjustments have to be made to guarantee the effectiveness of a mutual relationship. Occasionally adaptation means reciprocal learning and shared experiences. Adaptation means 'fitting' or 'matching' although matching broadens the conventional micro-perspective with macro levels (see e.g. Ghauri and Holstius 1996). Fitting occurs not just between firms and the markets, but also with the environment in a similar way as adoption (taking over an idea or technology for one's own purposes), which is more influenced by external determinants.

The Transaction Cost Analysis (TCA) frame as a theoretical approach also considers the adaptation problem, which means difficulties with modifying agreements to changing circumstances e.g. because of environmental uncertainty (Rindfleisch and Heide 1997, 31). In this sense the TCA is close to the network explanation, though in transaction cost analysis more interest is shown in macrolevel adaptations and the questions of adaptation. In the modern marketing theory, in which adaptation is one of the major dimensions, the concept means fitting and modifying the capability to the needs of the customers. In fact, customisation, as it is often explained in marketing science (e.g. tailoring, modification, several other value added functions in manufacturing processes), mainly means products or services for customers. It should be pointed out that dyadic adaptations should be distinguished from adaptation processes, which have

broader perspectives on the macro level; that is on the network level. Brennan and Turnbull (1998a, 398) define dyadic adaptation by stressing the behavioural and organisational modifications at multiple managerial levels; these actions are '*designed to meet specific needs of one other organisation'*.

It can be hypothesised that adaptation consists of three main elements referring to all identified behavioural (social), organisational and technical modifications, and configurations for the network partner or operator. Often, the major trigger for the modified behaviour is an external constraint, pressure, or opportunities, which require reactions within the entire network. One of the members can be an initiator, provoking others for behavioural modifications. This implies that a recognised or recorded conscious incident or modification is a part in the adaptation process. However, some of the adaptive actions are unconscious by nature, and an actor can employ a new role without any personal notice.

Adaptation is not just a process indicating some form of a relationship, but a critical element in partnership as well, because it *creates mutual trust* for the operators. Hence, the prevalence of adaptative actions between two parties indicate the maintenance of a long-lasting relationship, whereas the lack of adaptations refers more to transactional and simple *ad hoc*- type of relationships (Brennan and Turnbull 1998b). The importance of adaptation is twofold: *first,* it is a prerequisite for trust, and *second,* it is one of the constructs in a long term, structurally bonded relationship.

There is a need for modified and re-organised activities (having impact on the activity structure and the relationships) to ensure the maintenance of an exchange relationship and to avoid temporal hindrances and malfunctions; synchronisation is thus required on all managerial levels. Modifications are needed because the counterpart may expect them; in this sense these activities have impact on the roles, as well. Activity links are means for adaptations, as they combine activities between two operators involved in a long-lasting relationship. Unquestionably, the resources are modified and configured according to the needs of the counterpart. Hallen *et al.* (1991) draw the conclusion that in the adaptation process both unilateral and multilateral sharing of power exists. A unilateral case is a consequence of imbalance of power. This explanation is, thus, consistent with the actor-reactor scheme. Multilateral sharing means reciprocal demonstrations of commitment.

Commitment is shown through willingness to adapt to different behavioural matters, e.g. readiness to accept a computer-based information system once adopted by one of the net members. In this process a partner presents trustwor-

thiness gradually, first by awareness, then by interest, and finally by acceptance. In addition, adaptation is one part of structural bonding between partners.

When contemplating the antecedents for structural bonding, Han (1997) proposes that one of the variables describing this special bonding type is technology. Though technology mainly affects structural bonding, it can also have an impact on social bonding. By implementing similar procedures the partners involved in a relationship express that they are ready for additional commitments in the long run as well. This is a positive feature and a signal of trust, improving interpersonal relationships on multiple managerial levels. Adjustments are not just a question of synchronising the processes, but also the technological, administrative, and even behavioural characteristics. Technology in this context can refer e.g. to the use of advanced solutions in information sharing (e.g. EDI, XML or similar).

When presenting a way to classify various types of adaptations, Brennan and Turnbull (1998a, 34, 35) use a taxonomy. According to their proposal the following categorisation is adequate: resource commitment (high with the production process - low with rescheduling the deliveries), proactive/reactive (requested by the partner (reactive) or maybe initiated without request (proactive)), voluntary/coerced (adaptation may have been conceded willingly (voluntary) or may have been enforced by a more powerful partner (coerced)), reciprocal/unilateral and formal/informal (formally agreed with contractual arrangements). It seems that they distinguish clearly between voluntaristic and coercive types of reactions; also the power issues are addressed. With respect to interorganisational roles, the question of requested and coerced adaptation arises.

Reactive adaptation behaviour as a response to the initial provocation made by the counterpart can refer to the role of the reactor. It means that the actor under consideration is more or less obliged to obey the internal norms. However, and from the theoretical point of view, *coercive adaptation* is more *adoption* than real adaptation.

The process for adaptation has different stages as well (Holmlund 1996, Brennan and Turnbull 1998a). First, there is identification of suitable and appropriate technology. Later legitimation is needed to ensure the relevance of the technology as a driving force for a more intensive interfirm cohesion. Later, adaptation will occur. As regards the depth of the adaptation process temporally, besides conventional matching on the micro level, accommodation represents a deeper form of adaptation. Accommodation means that the fitting is more a less an obligation for the other party to adapt to. An even more comprehensive form of ad-

aptation is assimilation, in which the process or a procedure will be incorporated fully; as a consequence similar processes exist between two parties. This is close to diffusion between partners - a consequence which has been proposed by Brennan and Turnbull (1998a, 1998b) - for adaptation in the broadest and tightest sense.

The adaptation process can be associated with the learning process as well. Through cognitive bonds it is one of the major assurances for an on-going relationship; it can be even a prerequisite when a relationship is established. Furthermore, without adequate adaptation, a relationship may not be developed properly in the long-run. Easton (1992) distinguishes between two elements - adaptation and exchange - when elaborating a simple transaction between partners. The more exchange there is between the partners involved, the more probable intensive adaptation will be. Moreover, adaptation has a long term notion. In this sense adaptation is even required to ensure a long-term relationship.

Adaptation *per se* is associated with activity links which are '*used in order to grasp to what extent adaptation of the firms' respective activity structure has been done*' (Dubois and Waluszewski 1998, 187). There have to be some modified and re-organised activities (and later activity structure configurations) in order to ensure the maintenance of the exchange relationship.

Interaction Processes, Emergence of Relationships and Outcomes: a Synthesis

Considering the discussion in the previous chapters, it is now proposed that interaction has two complementary aspects: processes and outcomes. These aspects can be found among all the actors involved: interaction is a multilevel phenomenon due to numerous managerial levels that are exposed to exchange. Besides personal - which can be formal or informal - impersonal interaction is apparent, e.g. technological adaptations. The following illustration depicts the levels of interaction with four distinctive layers (modified from Frankel *et al.* 1996, Han 1997, 23 and Möller and Wilson 1995):

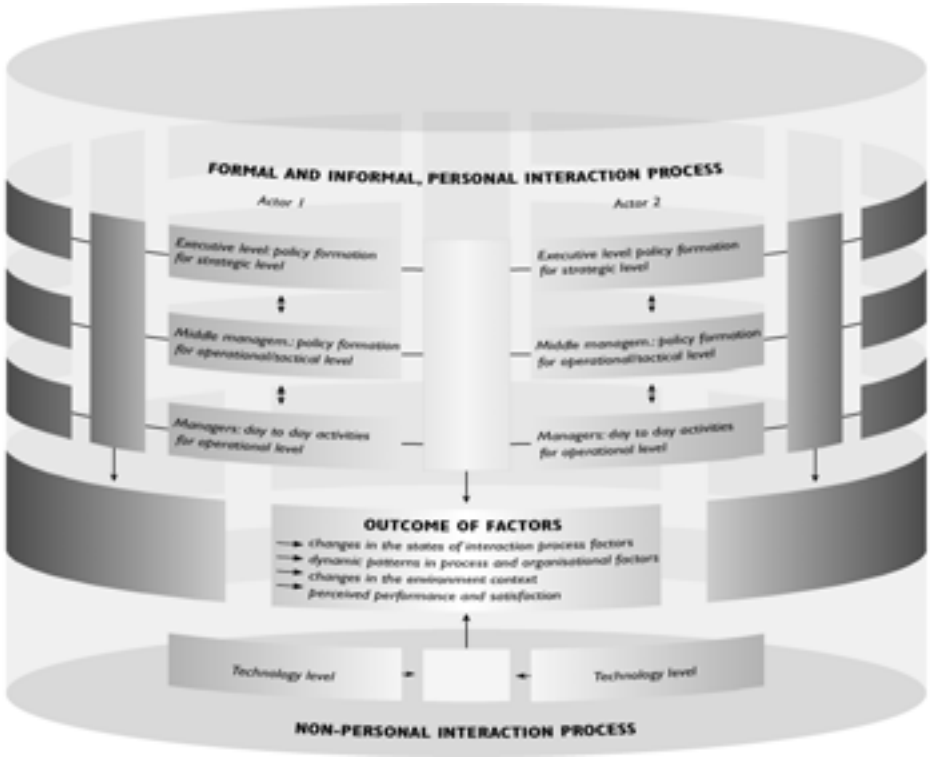

Figure 1. The Interactive Processes and Their Outcomes on Multiple Managerial Levels

A set of affecting variables with five different groups can be proposed:

- *contextual factors*: environment and situation (e.g. market concentration, characteristics of firms),
- *task factors*: degree of complexity and innovativeness of focal objects of interaction, their exchange frequency,
- *organisational characteristics* in terms of experience, resources, or management on an organisational, departmental/functional, group and personal level,
- *outcome factors*, which comprise bonds as perceived by the firms, and performance outcomes such as effectiveness and efficiency, (compare to Holmlund (1997), when she argues that the *perceived* results of the processes on different interaction levels are *outcome domains,* which means that this concept is related to the process perspective of relationships), and

- *the interaction process,* which contains exchange, adaptation, and co-ordination processes.[3]

For the analysis of relationships and networks the contribution of the model is noteworthy, as it explains the outcomes (e.g. changing roles) as a result of multiple bonds. Besides, the outcome is a result of interaction on diverse managerial levels (formal, informal), including constant assessment of satisfaction as well.

As depicted in Fig. 1, technology can be seen as a crucial element in the interaction process, as technology means a process of transforming inputs to outputs. In organisational technology, a sequence of events is defined: admission of input (e.g. knowledge) into the organisation, conversion of this input to output (through application of skills) and disposal of the output into the environment (Han 1997, 23). On the technology level the adaptation of adequate technology is of a major interest in the process of interorganisational behaviour. It can have an impact on social relationships and bonding as well.

It can also be claimed that relationships as basic constructs in a particular network are resources and they have value. Wilson and Jantrania (1997, 300) describe value with three different dimensions: economic, behavioural and strategic; in the strategic dimension an actor aims at gaining competitive advantage or strives to strengthen the core competencies.

[3] The original model proposed by Möller and Wilson (1995) has several applications in different contexts (e.g. Frankel et al. 1996, Han 1997, Halinen 1994); e.g. in the study by Halinen (1994) the indispensable prerequisites for establishing a relationship are addressed as well as the perceived outcomes of an interaction process. Adaptation as a component in bonding, as well as its dimensions - social, technological or other - have been investigated, though not with logistical issues in focus (Hallen *et al*. 1991, Wilson and Jantrania 1997, Han 1997, Naude and Turnbull 1997, Williamson 1991). Regarding the interaction model by Möller and Wilson (1995) and the strong emphasis on processes, Pettigrew (1998) proposes five features that should be viewed in processual analysis: embeddedness, studying processes across a number of levels of analysis, temporal interconnectedness, studying processes in past, present, and future time, role in explanation for context and action, search for holistic rather than linear explanations of processes, and a need to link the process to the location and explanation of outcomes. Pettigrew's proposal (1998) is consistent with that of scholars who have explained and utilised processual analysis (e.g. Tikkanen 1997, Halinen 1994).

Furthermore, Holmlund (1996) has categorized economic, social, and technical dimensions. Järvelin and Mittilä (1998) have enhanced the dimensions by presenting an ultimate dimension. Consequently, the relationships *per se* and more particularly their dimensions attached by the idea of quality can represent the positive perceptions, when an actor considers the benefits of the interaction. The dimensions can thus raise the value but also trigger more intensive and deep collaboration, because the relationships are loaded by value.

The context in which the proposals have been made affects the content of the dimensions discussed. In both studies a typical seller-buyer- relationship has been under scrutiny, referring to dyadic relationships, and ignoring the behaviour on the network level. For Holmlund (1996, 84) the dimensions refer to different aspects of the content. Furthermore, she suggests the use of the concept domain*;* with it she means an '*arena in the value creation process within the relationship where quality is observed* '. At the same time Holmlund (1996) - with reasons - criticises the dimensions discussed by Wilson and Jantrania due to the fact that for Wilson and Jantrania value is understood as a positive feature implying *'benefits'* without any notion to investments or other *'sacrifices'.* Furthermore, the genesis of value expressed by means of a simple correlation has been launched by e.g. Grönroos with the PRV- formula. There is a correlation between PRQ and PRV: the former denotes '*a characterisation of the focal firms' perception of RQ as a combination seen outside of the dyad,* whereas the latter includes '*a comparison of quality and investments as perceived by the firms.* (Grönroos, 1997, 79). The outcome, quality, is an important factor when value is assessed and measured representing the *'gets'* or the '*rewards'* (compare to the value creation logic in logistics, and the significant role of perceptions in value assessment). Järvelin and Mittilä (1998) add the time-element to the relationship's quality; this means that instead of using a single relationship quality measure, a distinction should be made between two items: the episodes (a short-term notion) and relationship (a long-term notion). Subsequently, there is a slight difference between the perceived quality in the short and long run (Holmlund 1997).

Some general observations can be listed on the basis of empirical studies on relationships (Dubois 1998, 15,16):[4]

- continuity: the major relationships of a company are often long-lasting,

[4] Dubois addresses the importance of non-contractual commitment in relationships, which can be even a tool for mutual governance. In the embryonic phase the contractual ties are important - not for governance but more for establishing and strengthening the relationship.

- complexity in terms of the range of contacts among individual firms,
- low degree of formalisation: formal agreements have seldom been found to be used as a means of handling uncertainties; on the contrary trust seems to be of main importance and more relied on,
- symmetry in resources and initiatives: both parties control resources which are of the main importance to the counterpart,
- adaptations: both parties make them, for instance logistical, technical, or administrative adaptations,
- both co-operation and conflicts are present (compare to deleterious and constructive effects presented by Andersson *et al.* 1994), and
- connectedness: the relationships are connected in many ways and to different extents; the technical content is quite important.

With respect to interacting parties, in a dyad two partners aim to co-operate together and gradually deepen the collaboration. This constellation is identical to partnering studies in which the dyadic perspective is emphasised. In its initial stage a dyad is looser co-operation (or dialogue as noted by Grönroos 1995) than strategic activity. In the interaction process, two firms are predominantly involved; often this dyad is also under scrutiny. However, some researchers (e.g. Salmi 1995, 39) have the focal firm as the main point of interest in the research.

Because it is claimed that each interpreter perceives reality by him/herself, social relationships are very important for every actor. Therefore enough analytical attention should paid to the social elements in the networks (human interface vs. technological interface). This means also that the dimensions of network engagement (e.g. how a single actor e.g. an entrepreneur is embedded in the network) should be analyzed properly. Indeed, embeddedness as a term can refer to the social context or structures in which actors are embedded (e.g. in nets), although there seems to be some pluralism in defining the concept (some scholars give a range of related aspects and dimensions for the concept (Halinen and Törnroos 1998); some others consider mostly economic and technological ones (Ford *et al*. 1998, 264); even hierarchial, multi-layer depictions have been proposed (e.g. Törnroos 1997, 627,628).

Nets as Structural Elements of Networks

Relationships are caused by the interaction between the diverse actors in the network. It is now proposed that a network as an entity is an obscure concept,

as most of the members of the network identify themselves to some smaller unit; also the frequency of interaction tends to be higher with those members for whom a single actor has quite a close organizational proximity. The relationships in these smaller units lead to an emergence of *nets.* This implies a network structure, which is a constellation of various, partly overlapping nets as follows (see Fig. 2).

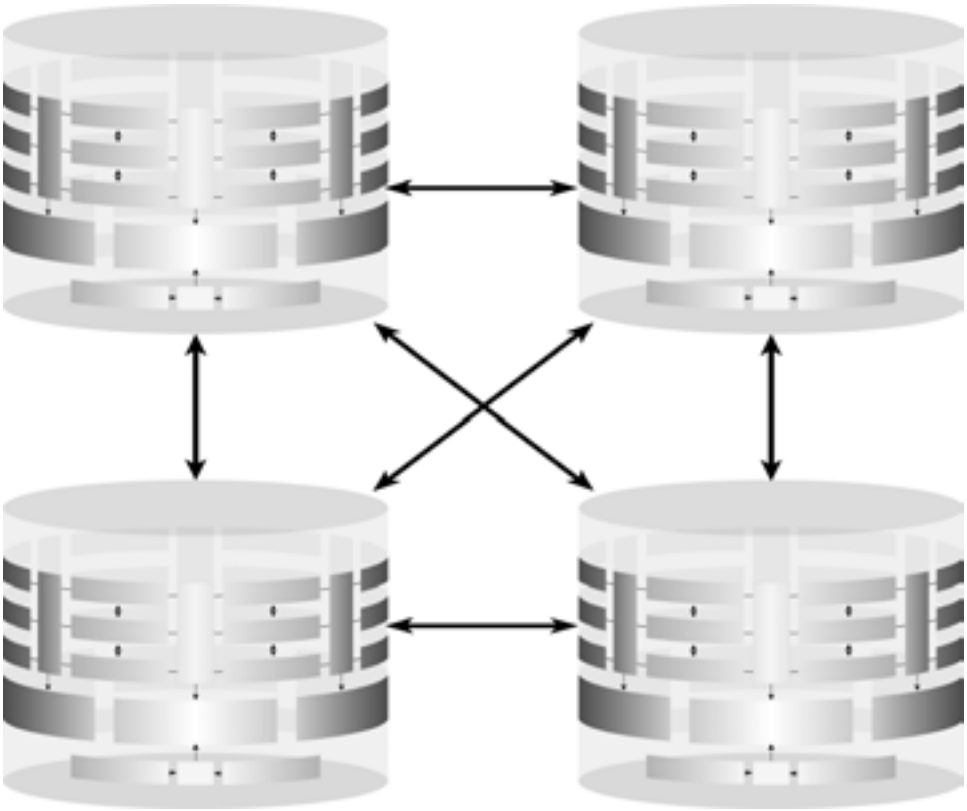

Figure 2. Creation of Networks through Diverse Nets and Inter-net Collaboration

As a consequence, a limited and specified set of actors can and should be examined. As such, nets are smaller units of the entire network and they '*provide*

a lower level of analysis', as Easton (1992,18) puts it. From analytical point of view, it is an extremely difficult task to create even a clear picture of the network, and subsequently to model the network structure, due to the heterogeneity of the network actors and the infinite number of relationships. In order to model the network structure, an appropriate classification method is required. As a unified entity a network can be split up to sub-categories (smaller units) using appropriate parameters or perceptions in the classification. In the subdivision process to smaller nets, such criteria as geographical, technological, functional, (as often in SCM) or perceptional (as in the network approach) can be valuable. It can be postulated that a network is actually a constellation of various, partly overlapping nets including tying actor bonds, which strengthen the relationships and which the roles/positions are based on. In pragmatic analysis a net is actually often under consideration, not a network. Occasionally, though, these words – net and network – are used as synonyms.

In logistics, *triads* are often in focus; the triad is the smallest unit of a network in which both direct and indirect relationships are typical; a dyadic relationship contains just direct relationships. When triads are classified in logistics research, the involvement of the third actor (practically e.g. forwarder, carrier, TPL provider) is gradually increased in a dyad; this evolution progresses over time. In practice, the third party can be either an intermediary, working on behalf of the shipper or receiver, an integrator, or some other service provider.

Some researchers use the term local network for the subentities of networks because of the strong geographical connotation they can carry, for two reasons: first, the different types of embeddedness in related studies, and second because of the strong geographical features the studies might have (Tikkanen 1997, 70 footnote). Cova *et al.* (1998, 206) even propose the use of the concept milieu to distinguish between two types of network which are conceptually identical but functionally different: the networks of proximity (referring to spatial but also to cultural and psychological proximity) and transterritorial networks (global networks).

Perception of appropriate relationships can be a key element in defining the limits for a focal net; e.g. Salmi (1995, 45) defines a focal net as a '*net of direct and indirect interorganisational relationships that the focal firm perceives (...)'*. Accordingly, the boundaries are identified by the focal firm. In general, a focal net is briefly a company's or management's perception of its contex that are within its network horizon more than a freely chosen group of actors (Salmi 1995, Möller and Halinen, 1999). Thus, the major task for the deeper analysis should be to capture those network relationships that might have relevance for a focal firm.

Conclusions

One of the most important objectives of this essay was to reveal those conceptualisations which are not explicitly explained in the Supply Chain Management (SCM)- based approach and which are needed to understand the logic of nets and networks (and view) that is rarely discussed in detail (e.g. major interorganisational processes and their outcome). From analytical point of view, it is of great importance to find out the major managerial levels, including also a discussion on how the relationships are conceived through the interaction processes (exchange, adaptation, coordination). Finally, a synthesis was made by combining the levels of interaction, the dimensions of the relationship creation procedure and the outcome of the interorganisational processes.

Basically, the Industrial Marketing and Purchasing group (IMP)-based theory differs from the managerial network approaches as it absorbs the idea of interaction rather than employing the mechanistic stimulus-response (SR)-scheme. Because of this, some suggestions in this network view differ from the conventional managerial explanation, which is still typical for Demand SCM- thinking; despite of network dynamics, even inertia is often caused by tight and robust bonds. The tentative model (Fig. 1) as a theoretical synthesis can give ideas for further analysis of relationships. Also the analysis of networks requires efficient use of diverse nets (e.g. triads, geographical, value nets, focal nets), which can be defined as smaller units on the entire network structure (Fig. 2).

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Essay 2

Contribution of the Industrial Network View for Analysing Supply Chain Management

Abstract

This theoretical paper concerns the Industrial Network View (INV), especially in connection with the IMP-School of thought (Industrial Marketing and Purchasing Group), addressing its contribution for conventional Supply Chain Management (SCM), which is the epitome of the strategic way of thinking in modern logistics. There are some pitfalls in employing SCM: e.g. it depicts a reality where one firm (actor) dominates over others in terms of technological exellence, capabilities, power or size, which is not the case in complex networks with multiple players and an abundancy of business relationships. Moreover, in empirical analysis, SCM often addresses the higher managerial levels, emphasising their decision-making. However, much of interorganisational behaviour tends to be interpersonal, taking place on lower magerial levels, and being influenced by the social structures. In SCM the examination often relies on classical modelling (the hypothetic-deductive approach in the analysis and the mechanistic stimulus-response/SR- scheme) accompanied by an urge to trace practical strategic benefits. In the industrial network view, in turn, the theory is based on interaction between the actors in general; the actors can be firms or human beings. Theoretically, in the industrial network view the grand view of human interaction relies on the idea of interaction in contrast to considering actions and reactions (proactive and reactive measures respectively) as responses, as implicitly presumed under SCM. Through the industrial network view, the logistics research is enriched by the proposals, concepts and ideas created in social sciences, and more particularly in the social exchange theory. As such, this particular theory can contribute to the development of SCM- based thinking, especially when in-

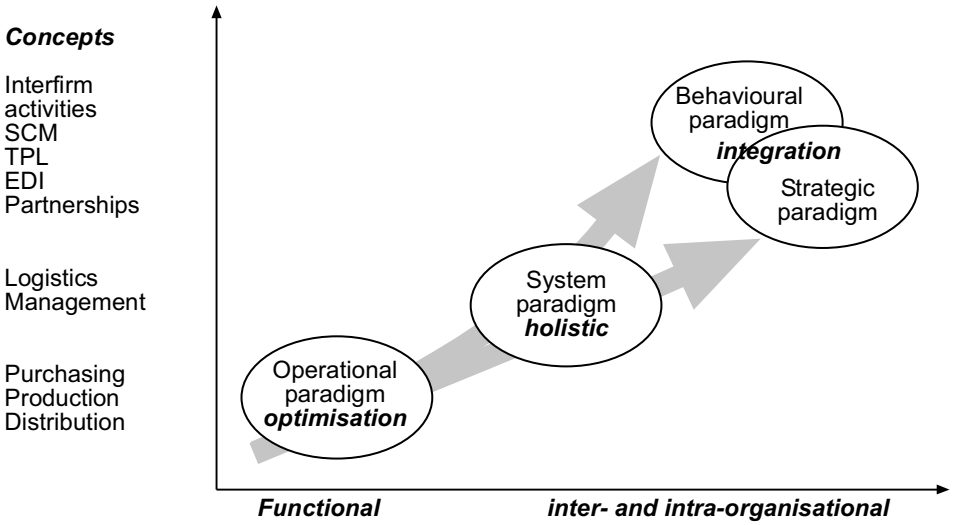
terfirm cohesion is under scrutiny, by highlightning the behavioural aspects of interorganisational collaboration.

Introduction

In logistics, there has been growing interest in the network theme among practitioners and researchers. The network, as defined in this study, is a *constellation of interconnections among actors* (e.g. firms, teams, persons). Despite the fact that infrastructural networks have been widely elaborated in logistical analysis (see e.g. Lukka and Lensu 1997, Törn 1999, Dornier *et al.* 1998), more attention has been recently based on the relationships between the firms. In conventional infrastructural network models the ties are not explained as relationships but rather as concrete links. However, it seems that the *managerial* or *strategical explanation* of networks will be gradually replaced by contemporary views in which the theoretical underpinnings are different: there is a dawning of behavioural paradigm in logistics science compared to the conventional strategical one and its dominance. It is thus challenging for the researcher to compare and contrast the two distinctive worldviews especially in logistics, in which strategic thinking, represented by SCM, is still in a dominant position.

The major objective of this study is to reveal theoretically some suggestions proposed by scholars in Industrial Network View (INV) and address their contribution to enrich the contemporary logistical analysis and theory-making by providing new mindsets. The work by IMP-Group (Industrial Marketing and Purchasing) can be regarded as a reflection of INV. Unlike Supply Chain Management, INV is well-equipped to describe how the firms' pursue network logic by e.g. expressing the conformities of network engagement. To position the approach/es and methods to recent logistical paradigms is also needed.

Indeed, the prevalence of two distinctive paradigmatic explanations in modern logistics gives theoretical foundations for the analysis. It is assumed that these two proposals give the researcher different angles for explaining the themes of interorganisational behaviour, as well as the roles and positions (see Figure 1; adapted from Christiansen 1998, Kent and Flint 1997, Nikkanen 2003)



Major level for analysing the acticities	Channel	Supply chain Infrastructural networks	Network Social structures
Approach	Analytical	Systematic	Actor
Major Influence	Industrial Economic Management Science	Management Strategy Information Technology	Marketing Social

Figure 1. Relations between Recent Logistics Paradigms, Themes, Methodology, and Co-sciences

To sum up, the behavioural paradigm means that the logistics research is *enriched by the proposals, concepts and ideas created in social sciences, and more particularly in the social exchange theory* (e.g. role, position, power, embeddedness, identity, interaction). These proposals are often transferred through the modern marketing theory. The utilisation of IMP-based philosophy representing contemporary marketing theory and Industrial Network View means also the rejection of the simple stimulus–response– model; an interaction type of exchange (the actor-actor scheme) is thus addressed. In other words, the '*process is not one of action and reaction; it is one of interaction*'(Ford 1997, xi). The contribution of state-of-the art marketing theory ((Customer) Relationship Marketing/Management) including its strong interest in analysing networks can be significant in modern logistics thinking (see e.g. Christopher 1998). In the strategic

paradigm the *examination relies more on classical modelling* (hypothetic-deductive approach and mechanistic SR- scheme as a presumption) attached by *an urge to trace practical strategic benefits.* In logistics science the managerial, or strategical approach (as represented by the SCM) has traditionally strongly affected not only the strategical decision making, but also the research work.

Limitations of SCM-based Thinking

Although Supply Chain Management and its managerial nature are an essential part of modern logistics thinking, some critical notes have to be added. New and Payne (1995) associate SCM with *unhelpful research practices,* because it has some weaknesses: enough empirical evidence may not be found and the basis might not be a relevant one to support some basic ideas. As a result, a widely-accepted discipline can be harmful as it can be a '*wisdom*'; the theory stipulates the norms for analysis defining what is a valid approach and what is not. According to New and Payne, the domain is too broad and wide, and thus it reduces the scholars' ability to find out the real points: '*it becomes less clear what differentiates the subject as a distinctive field, and what constitutes valid research questions and investigative strategies'* (New and Payne 1995, 69). Moreover, the use of SCM has an impact on the research strategies as well; *the use of deductive reasoning has guided the scholars in logistics, and the use of inductive theories has not been in focus in a comprehensive manner.* In addition, supply chain ideology is mainly applicable for conditions in which a *traditional manufacturing industry is performed*, and it is not so well suitable for explaining the regularities *in service industry*. Furthermore, the value creation logic in supply chain theory is problematic: value is created through sequential activities, with interlinked, partly overlapping or extended value chains. More evident is that the relationships *per se* have value and the processes are more non-linear, parallel and matrixed in nature.

In networks it is not often a question of how the firms operate, but rather how the actors in a broad scope are involved in the network/net. This means also that much of the interorganisational behaviour is as much interpersonal as based on formal and rational decision-making across firm boundaries. Accordingly, the question of a real win-win situation is problematic, as every network hides the conflicts of interest and deleterious effects; the actors want to be involved in the network despite of these constraints. In SCM the non-positive features of the re-

lationhips (e.g. conflicts, disengagement) are – if not totally ignored – discussed in minor details. In general, the relevance of SCM is poor in explaining the various elements of the interorganisational ties (such like actor bonds) between the network members.

SCM depicts a reality where one firm (actor) dominates over others in terms of technological exellence, capabilities, power or size. This is not adequate in many networks, though e.g. integrators have been rather active in creating new business. The network members are not obliged to adopt e.g. new practices or norms since there cannot be a ruler, but they rather adapt their own behaviour and processes depending on their role in the network. The interfirm role, and more accurately, the position is dependent on the interorganisational proximity between the actors.

As noted, SC is a *rough* simplification of the reality. It has been typical within SCM-based analysis that the multiphase, sequential processes are simplified by means of concrete conceptualisation. Often the major objective for the research is to find out the *causes and consequences* in the facility network. However, the role of single actions or events is not fully understood in SCM especially if these events are triggers of change but the effects cannot be explained fully. For this reason e.g. Wilding (1998, 46) states that the chaos theory can explain some of the odd points in chain systems; namely the inevitable facts that '*a small change to an individual unit* (like a firm's single activity) *within a system* (like a supply chain) *may result in dramatic effects of the global system'.* As regards the chaos theory, it can be claimed that though the supply chain looks deterministic in practice, the reality is different. The question of the causality stems from the fact that SCM scientists accept implicitly the use of the SR-scheme and its mechanistic worldview in contrast to the network view, which depicts the reality in a more organic way. Also, it is not a question how the system creates intermodalism but rather how the network is created through the engagement with the help of stable or dynamical roles the actors might have; moreover, the actors are embedded in the network, which consists e.g. of social structures. The SCM theory is poorly equipped to explain the true nature and impact of these social elements.

Theoretically, chaos can generate patterns as well; the pattern is just more or less stochastic by nature. More accurately, the network approach considers multiple events when the regularities are explained *by addressing the non-linear pattern of processe*s. The outcome is thus *less deterministic, implying an impressionistic interpretation of the reality.* Among SCM practitioners there tends to be an illusion of totally managing the chains/systems.

With respect to scientific analysis, in SCM they often address the higher managerial levels emphasising their decision-making. A network is a constellation of nets, processes, and structural elements on multiple managerial levels. Hence, influential decision-making often takes place on tactical, not on executive level. Particularly the use of SR-scheme, addressing the functions that the firms perform instead of roles/positions can be an obstacle for understanding the real character of network logic. Interorganisational co-operation is influenced as much by the behavioural aspects as by the physical processes between the modes.

Moreover, more attention should be paid to the bonding mechanism, considering its scope and depth. In SCM research these features have been implicitly embedded in the surveying but not exhaustively understood or analysed. Arguably, this notation affects the strategical decision-making as well. The conventional - or rationalistic view as Ford et al. (1998) claim - view for strategy development is a series of sequential, hierarchically organised activities including the core processes: analysis ⇒ planning ⇒ decision-making ⇒ implementation ⇒ control (the APDIC- model). The *organic view*, in turn, as presented by Ford *et al.* (1998) emphasises the interactive nature a strategy development encompasses. This means that there is interplay between some identifiable, interwoven core elements in this process (Fig. 2)

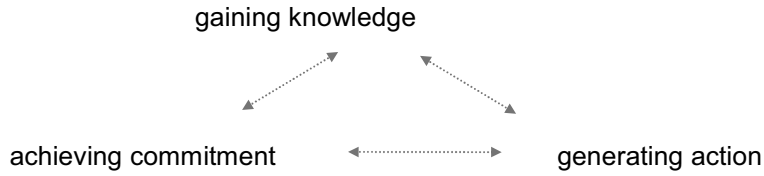


Figure 2. Ingredients of Organic Decision Making

Knowledge is generated through interorganisational learning with the adaptation process as one of the fundaments. It can be suggested that in logistics research, adoption is widely recognised as a process but less interest has been shown in adaptation or even assimilation, or other types of responses, which are fundamental when interorganisational behaviour is explained. In general, behavioural responses – both from theoretical point of view and considering the pragmatics – can give insights for analysing the roles of the actors in the networks.

Industrial Network View

As regards the Scandinavian network research/ IMP Group's work representing the Industrial Network View, there is an abundancy of examples of successful use. Though there are lot of differences in details, the researchers share the same theoretical background also on metatheoretical level. Typical for the Scandinavian research are e.g. the following issues (Tikkanen 1997, 595):

- subjectivity and context boundness of reality and knowledge, both in business and research situations,
- emphasis on benevolent, co-operative behaviour aiming at mutual goals, which seems to refer to an intentional, voluntaristic view of human nature,
- reliance on the subjectivist focal firm's view on its own business context, and
- general interest in understanding the dynamic processes related to various complex, fragmented and textured network contexts.

Tikkanen (1996a) notes that the Scandinavian tradition is more sophisticated and sensitive for postmodern research compared to the explanations created by management -oriented scholars. In the American tradition the main focus is on the strategic network approach with one firm as a dominator establishing and governing the hierarchical system (compare to the SCM analysis by Cooper *et al*. 1997, Cooper and Ellram 1993 and Mentzer *et al*. 2001 with the same kind of assumptions: chain integration is *initialised* and led by one *leading* and *controlling* firm vs. the voluntarism and joint-governance in the IMP-based analysis). In the network creation procedure it is not possible for one firm to control continuously the entire system of co-operative actors working together. As regards interorganisational processes, exchange, adaptation and co-ordination are of the in focus. Particularly the exchange concept has mainly three main dimensions: the exchange paradigm is established on discrete transactions, on hierarchy (as explained in the TCA approach according to the Coase-Williamson- theory), or on relationalism (Olkkonen 1996, 140). Moreover, the adaptation consists of three main elements: all the identified behavioural (social), organisational, and technical modifications and configurations for the network partner or operator.

The *structure of all the nets* (e.g. personal, social, technological) should be embedded in the empirical analysis if interorganisational behaviour in general is under consideration. In order to describe network structures, a limited and specified set of firms (actors) can and should be examined. As such, *nets* are

smaller units of the entire supply network and they '*provide a lower level of analysis'* as Easton (1992, p.18) puts it. However, network as term is problematic as it is very difficult – even impossible – to depict its scope. Indeed, Gadde and Håkanson (2002, p.184) claim that *'there is no natural network boundary – any boundary is arbitrary.'* This means that networks are actually borderless; the dynamics stem from the fact that a researcher should always question the boundaries of the entity that is scrutinised. Inevitably, it is an extremely difficult task to create a clear picture of the network, and subsequently to model the network structure, due to the heterogeneity of the network actors and the infinite number of relationships.

One of the major pros with INV is that is breaks the conventional thinking is which the firms as actors are presumed to have either proactive or reactive responses in interorganisational collaboration (thus in accordance with SR-scheme). In contrast, all the actors tend to have multiactive responses to the proactive measures or the initialised effects, which mean that they take, leave, reject, ignore, transfer, or stipulate, while acting or reacting. Hence, they are *not* tied to one form of response. Indeed, it is possible to categorise different kinds of actions and reactions when coping with the question of responses in a network; e.g. Easton and Lundgren (1992) define five distinctive sequences: reflection, adaptation, absorption, transmission, and transmutation. Reflection occurs when an actor is rejecting the changes, while adaptation implies a situation in which change is managed by negotiations in the dyad, not influencing the other members of the network. Absorption is close to adoption as a conceptualisation, since in this response the actor accepts the changes. In the case of transmission, an actor transmits the effects of change to the other members in the web, whereas for transmutation it is typical that the receiving actor adapts the changes but also transmits the changes – and the requirements and obligations as well – to the rest of the network. In general, Easton and Lundgren (1992) clearly distinguish between responses in a dyad and responses in a net or network context. Often, however, the main focus is on chosen dyadic relationship, and therefore the network reactions (transmission, transmutation) do not have such a prominent role in analysis. Also, much of the interorganisational behaviour tends to be rather interpersonal, based on cognitive and social bonds between the people representing their companies, than purely interorganisational (compare to table 1).

Table 1 as an initial suggestion explains some of the *differences* e.g. in terms of analytical matters between two distinctive perspectives to analyse networks in

modern logistics: the managerial view represented by the SCM thinking and the network view are under consideration.

Table 1. Differences between Managerial and Network Views

Issue	Managerial View/SCM	INV
Main Objective in Network Presence	to manage	to develop
Strategic Decision Making Procedure	Rational	Organic
Levels on Focus in Analysis	Executive	Multiple managerial levels
Assets	Tangible and Intangible Resources	Relationships
Boundaries of the Firms	Clearly defined - independency	Dissolved / borderless - interdependency - dependency
Dominance	One or two for a chain / system	Any actor in a net / network
Major Theoretical Problem setting	Markets or networks	Markets as networks / between markets and hierarchies
Processes	Sequential, linear in ⇒ chains/ channels ⇒ extensions required	Non-linear, parallel, matrixed in ⇒ networks and nets
Typical Behavioural Responses	to react / to proact / to adopt	to adjust / to adapt / to reflect/ to transmit
Strategical Decisions	Mainly due to rivalry	Also for network change, dynamics and stability
Knowledge Deployment	Organisational teaching	Mutual learning, open dissemination
Intraorganisational Decision Making	Hierarchical: top–down Renewed hierarchical: bottom-up	Horisontal, cross-functional exposed to transparent info sharing
Theoretical Approach for Structures	Simplification: systems - subsystems	Complexification: dyadic – networks
Theoretical Explanation Constrained by	*Ceteris Paribus*- assumptions	Context-bound- considerations

Researchers Role	Interpretative, analytical	Reflective, committed
Epochal Period	Industrial / Modern	Postindustrial / Postmodern
Analytical Scope	From α to Ω / Controllable	Impressionistic / Chaotic
Driver for Better Performance	Strategical thinking	Strategizing actions
Theoretical Applicability	Mainly reductionist view: more universal	Reductionist and holistic: more particular
External Surrounding	Environment representing faceless external forces	Rather context, identified actors; embeddedness prevalent

Inevitably, table 1 absorbs out all the *weaknesses of tight dualistic classification* and hence it can not be appropriate in every detail. Consequently, these two distinctive views approach each other as figure 3 shows.

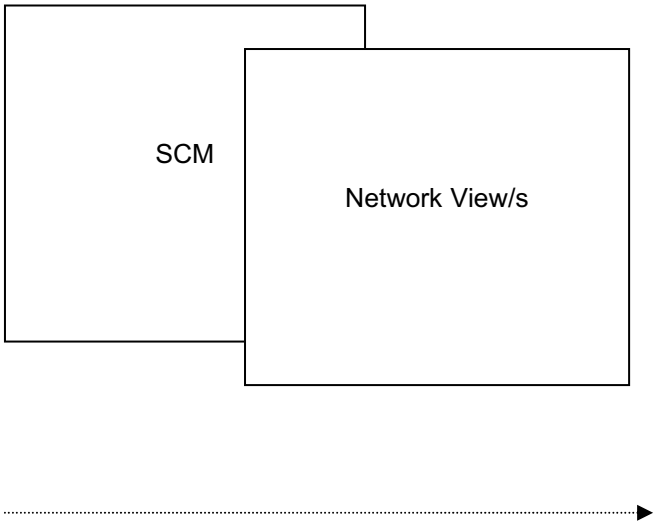


Figure 3. Convergence of the Network Views in Logistics

In the illustration the horizontal axis presents how the degree of abstraction increases. It seems that in near future there will be a convergence between these two different views.

Analytical Matters in INV

During the last decade, two mainstreams for research have dominated the analysis in Finnish business studies: the *nomothetic* or positivistic (or as Easton 1998 defines it: the nomothetic/hypothetico deductive) approach and *the action-oriented /subjectivist approach* (Tikkanen 1997, 113). It seems that the qualitative methods generally associated with case studies have gained more success. However, qualitative methods and the use of case methodology - single or multiple - has gained more popularity among researchers, though some criticism has been presented regarding the relevance of this method. In logistics, however, the modern positivist paradigm based upon testing the theoretical frameworks created *a priori*, seem to be more common (Garver and Mentzer 1999).

There is a need to enhance the traditional, more analytical, and technology-based analysis with more holistic and integrative, socially-oriented methods in logistics science; action-oriented approach as an option, though resembling the traditional case studies, differs slightly from them: more attention is paid to real human action on different managerial levels with strong emphasis on every person's involvement and their interpretations of the reality. It is essential to analyse the activities and even the single acts, episodes or critical events by splitting the phenomenon to its core categories. Furthermore, there is often no pre-defined theoretical framework including hypothetical suggestions. Some recognisable features include also *pragmatism, non-standard procedures, experience based data,* and even *intuition,* which all are highly addressed (Tikkanen 1997). The researcher is in continuous interaction, and even debate with the actors to be analysed. Besides, it is not possible to analyse *action and context* separately. However, it can be difficult to draw a line between ordinary case studies and the action-oriented approach.

Practically, under an interaction-oriented approach the working process should be based on *the idea of iteration* having distinctive stages to go through. The practice, thus, approaches the subjectivist view in which the dialogue between theory and practice is highly emphasised. The idea of iteration means a *recurrent and continuous dialogue* between the theoretical foundations and the empirical examination. Therefore conventional modelling with hypothesis to be tested under a robust framework created *a priori*, is not always valid. The follow-

ing illustration depicts graphically the logic of the (deductive)-inductive cycle, and interplay between theory and *empiria.*

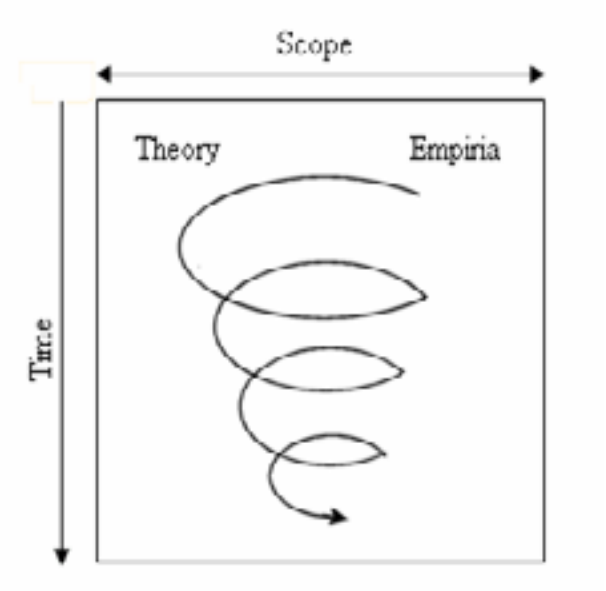


Figure 4. Iterative Research Procedure

Although the illustration has an appearance of a linear process, many of the research acts should be done simultaneously, and even in the reverse direction, implying a loop-wise procedure. Hence, the researcher aims at making *intermediate synthesis of the information that is in use at a specific moment.* Especially this was true when coping with conceptualisation (theory-making with 'conceptual vocabularies' instead with 'conceptual frameworks'). Moreover, the importance of secondary material is noteworthy as well as the acceptance that the research orientation might be influenced by the degree of pre-understanding. The idea of continuous iteration is especially vital when the impact of social structures is analysed. Basically, if network phenomena are under consideration it is not just a question of how production systems create products or services (with input-processes-output logic) nor a question of how networks produce it. The notion of how a *network is created through the joint-performance of all the actors is an important aspect from analytical point of view.*

In pragmatical case-based analysis, regarding the classical asking-answering way of communication (which means the use of the actor-reactor- scheme), New and Payne (1995) are of the opinion that getting reliable data requires more than just simple asking. Besides, the most interesting questions are often the most difficult ones: the motives behind personal behaviour, e.g. on what basis the information is actually filtered, can be hidden and latent for the informants themselves. Therefore an intensive interviewing method requires a sensitive and interpretative way of communication to ensure the reliability of the research. This means that occasionally the researcher is obliged to do interpretations already when the interview is on-going. Besides, the researcher should be capable for modifying the range of relevant, flexible, and situation-oriented questions in every phase of the process in order to ensure the validity of the investigation. This is an imperative, e.g. if the informant cannot conceptualise the ideas with his/her own vocabulary.

With the help of an intensive dialogue the aim is to avoid 'WUAWUG- syndrome' by the researcher. The WUAWUG syndrome (What-you/U-ask-is-what-you/U-get) is one of the obstacles for the investigator to get in-depth knowledge regarding the interactive issues that are under consideration. A pre-defined theoretical framework might force the researcher to use the wording, concepts and expected causality of the pre-explained model, including the use of appropriate vocabulary. Undeniably, this significantly reduces the validity of the analysis. A rather similar idea is described by Gummeson (1991) when he discusses a *procrustean science* - an idea derived from ancient Greek mythology - which refers to misuses of theories and models for formulating the hypotheses to be tested. When such hypotheses are used as the point of departure in research '*they govern the way questions are asked and the way answers and other observations are interpreted'* (op.cit. 55).

Conclusions

In this study two different explanations for analysing logistics were presented. Despite of the fact that both of these models (SCM and INV) are employed when the network phenomena are under scrutiny, there exist substantial differences due to the discrepancies which are profound, even ontological in nature. INV is close to the behavioural paradigm which means utilisation of theories associated with the interaction; the ideas and proposes generated in social exchange theory are channelled often through the modern marketing theory (CRM). there are also

analytical implications derived from the assumptions adjacent to the theory. Strategic paradigm as represented by SCM is created for managerial purposes. Despite of the efforts for extending SCMs scope with new proposals, the assumption of SR- type of behaviour in interfirm context can be an impediment for employing this model if e.g. the impact of social structures on decision–making is in focus. Probably, in near future there is going to be a slight convergence between these distinctive theories.

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Essay 3

The Different Roles of a Railway Company in an Intermodal Freight Transportation Network

Abstract

The purpose of this study is twofold. First, there is a theoretical discussion of the role-position terms as conceptualisations. Second, an empirical testing of the appropriate roles/positions of the focal firm (railcarrier) in intermodal freight transportation is conducted.

Introduction

There has been growing interest in the network theme both among practitioners and in research. Despite the fact that in logistical analysis the infrastructural network structures have been widely elaborated, more attention has been recently paid to the *relationships* between the nodes. Conventionally, in infrastructural network models the ties are not explained as relationships but rather as concrete links. Nevertheless, it seems that the *managerial* or *strategical explanation* of networks (network as sets of nodes and links creating network-like supply chains) will be gradually replaced by contemporary views in which the theoretical underpinnings are different: there is a dawning of behavioural paradigm in logistics science compared to the conventional strategical one and its dominance (see Figure 1).

Furthermore, intermodalism (IM) or intermodal freight transportation (IFT) have been intensively contemplated by numerous scholars (see e.g. Woxenius 1994, 1998, Bukold 1993, 1996, Adjadjihoue 1995, Muller 1995, Gröhn 1998, Tuimala and Lukka 1999, Tuimala 2000, Bask *et al.* 2001, Aastrup 2003). Intermodal

transportation has been conventionally defined as *movement* of *unitised goods with at least two different transportation modes*. This particular mode of transportation is interesting for scholars analysing interorganisational behaviour, since it is assumed that intermodalism can be viewed as a total logistics service offered by a network of different organisations. Accordingly, this form of combined transport provides a testing ground to study more exhaustively the themes and dimensions of interorganisational behaviour. There is no real intermodalism without active participation of all the parties involved and without tight relationships between the operators and facilitators. The parties can be service providers (carriers, freight forwarders, transportation companies, port operators), agents, stakeholders (e.g. towns, regional associations), customers (shippers, receivers), or others (customs, even trade unions). In this study, VR Cargo (a strategical business unit of the Finnish railway company VR Ltd.) as *a railcarrier* is the *focal firm.*

It can be assumed that with and through relationships the actors create, perform and capture roles and positions, which also stem from the network involvement. In contrast, the infrastructural networks explaining IFT are conventionally regarded as systems of nodes, links, and functions. A new perspective providing new mindsets both for the theoretical analysis and more influential business practices can be employed by addressing the tasks, roles, and expectations of the operators (multitude of various behavioural acts and episodes). Furthermore, it is assumed that an actor might have *different roles* in the network depending on whether the role appears *in a dyadic relationship* or *in the network context.*

This study has ***two*** primary objectives. The ***first*** objective is to discuss the content of the role and position terms as conceptualisations. Although role as a term could refer to network dynamics, and to incremental and radical changes in the networks, in a similar way as position refers to stability and to influences of bonded structures (see e.g. Mattsson and Johanson 1992, Anderssen *et al.* 1994, Anderson *et al*. 1998*),* a slightly more intricate conceptualisation will be suggested. Moreover, IFT can be also an application *area* for the network development. Vital for the analysis is also the question of how the operator is embedded in the network. The theoretical examination relies mainly on earlier suggestions (e.g. Anderson *et al.* 1998, Aastrup 2002, Aastrup 2003) attached by some new proposals.

The ***second*** objective is to conduct preliminary empirical research work in which the practitioners representing the focal net are asked to give their perceptions of the role of the focal firm. The sample of informants consists of VR Cargo's major

partners in intermodal freight transportation. The informants account for a major part of the total revenue of the focal firm in domestic intermodal business.

The prevalence of two distinctive paradigmatic explanations in modern logistics gives some background for the analysis. It is assumed that these two paradigms (the network view as explained according to the IMP Group's suggestions and the facility network thought/Supply Chain Management/SCM) give a researcher different angles for explaining the themes of interorganisational behaviour as well as the roles and positions (see Figure 1; adjusted from Christiansen 1998, Kent and Flint 1997, Nikkanen 2000).

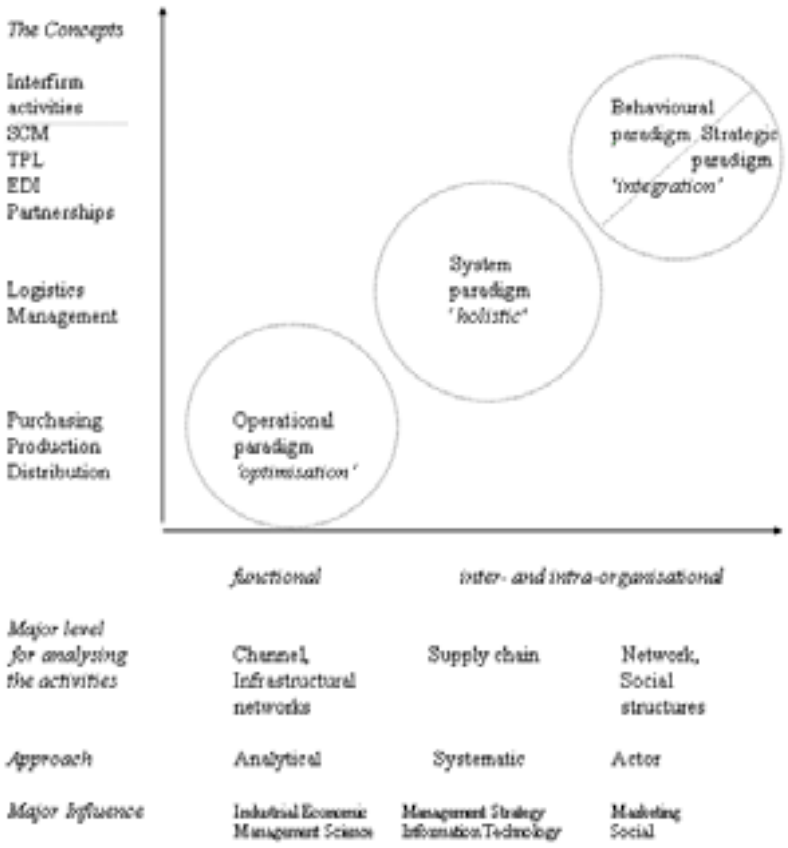


Figure 1. Relations between Recent Logistics Paradigms, Themes, Methodology, and Co-sciences

Among scientists in logistics there has recently tended to be more interest in the behavioural paradigm than the strategical one. This implies that there is also more interest in roles and positions and other behavioural aspects in interorganisational behaviour (e.g. identity, social embeddedness) instead of merely analysing the functions. From analytical point of view it is not of major importance how a system creates IFT, but how an actor is embedded in the outer reality through its presence and involvement. We also partly reject the use of simple S-R-scheme (stimulus-response simplification indicating the managerial worldview) and employ the idea of interaction, instead. Moreover, a distinction should be made between the *nets* (subentities of the network structure e.g. social, technological, or geographical) and the *network*. The convergence of these two different, partly overlapping paradigms is evident, however (for more discussion see Nikkanen 2000).

Role and position expressing involvement

Role

The terms role and position as conceptualisations are associated with the analysis expressing two opposite forces: change and stability (see e.g. Anderson *et al*. 1998). In general, the terms are coupled with network relationships having a past, present, and future. These dualistic terms have plenty of theoretical parallels. Consequently, there is an interplay with them expressing inseparability*; 'they are actually different facets of the same phenomenon'* as Halinen (1994, 252) puts it.

A role can be defined as a task which is influenced by both the position of an actor in the network and how he is embedded in it, and more specifically, in nets. The role requires some plausibility in the network; it is thus important how the other members perceive a single actor through the relationships. Regarding the temporal aspect of the concept, and emphasising the presence, a role can be expressed as a duty or a purpose of an actor in a particular activity. In this sense it could be an imperative right now implying to an expected pattern of behaviour associated with an assumption or a presumption for the future. More accurately, and considering the future, one can note that a role – and more precisely a position – *includes an idea of an expectation, and intention;* e.g. Anderson *et al.* (1998, 172) use the term role *'to express (..) actor activities as* (these) *emanate*

from the creation and sense-making process that characterizes each actor's own intentions and interpretations (comments in parenthesis added by the present author).

In this study, role as a term means a bundle of activities, and tasks performed by an actor in IM transportation, influenced by the expectations – generated through and with the help of network relationships – of what is perceived as appropriate (compare to Anderson *et al*. 1998). It is thus an appearance for the network members based strongly on behavioural responses. With the role, an actor is required to accept an adoption of tasks according to an expected pattern of behaviour, while with the position we more often refer to adaptation of tasks because of specific situations, and under different, more dynamical circumstances. Hence, an actor is ready to face a challenge of modified behaviour with respect to the role expectations. Consequently, the role is more a concept for analysing the behavioural aspects in the interaction rather than merely the expectations.

Though role is often associated with the change dimension in network studies (e.g. Anderson *et al*. 1998) we could assume that it could also refer to stability: on the basis of preliminary discussions with actors it seems that in the IM network there is a *robust tendency to accept and maintain the existing roles.* Hence, the roles are not just an outcome in a long temporal process because of stable tasks in the network, but because of structures. Bundles of bonds (e.g social, technological, co-ordination) and bonded structures are an assurance for on-going collaboration within permanent relationships. With the help of steady roles the (pro)actors settle terms for collaboration. Moreover, it is possible to define role switching, which means that in different situations an actor might have different roles.

As regards the role of the focal firm, it should be remembered that there is still a *government-erected monopoly,* which means that the focal firm has an exclusive right to maintain railway service on domestic tracks, implying a sole operator case. Consequently, there is an external obligation stipulated by the public authority to cope with certain transportation activities. The actor can change the position through role performance, however. On the other hand, this is possible only on a limited scope because of the network involvement e.g. role of the common carrier do not allow the focal firm to change the position radically.

In the network approach the role conceptualisation describes the dynamic aspects of the position because scholars tend to underline both the impact of social structures and the processes within (see e.g. Halinen 1994, Anderson *et al.*

1998). This is due to the fact that these suggestions stem from the role theory and behavioural sciences. However, the power of structural aspects – the strength of the actor bonds – indicate that the other actors (members in the focal net) can influence the behaviour in terms of stipulating the norms for the behaviour, which thus reduces the focal firm's ability to extend the scope of the behavioural responses. Also Havila (1996) claims that actually the role as a concept includes the dynamic aspect of network behaviour. The idea is derived from two distinctive sources: she strongly emphasises the *social structures*, and uses the term to gain some explanatory power for the investigation. The social structures are more vulnerable to apparent changes than e.g. the technological ones.

Theoretically, it is assumed that the main roles of the operators are those *of actors, reactors,* and *interactors*. With actor we predominantly mean proactive measures in a dyadic relationship. Considering particularly the contractual bond we could define these as principals as is often done in jurisdiction. Because an actor is deeply incorporated to its role, the principal has certain rights, and certain opportunities to interpret and judge the situations, and give specific meaning for the events. An actor can also be an initiator. Reactors are more likely to have reactive measures. In practice, they are often called as subcontractors. Hence, they are strongly tied to the counterpart with a contractual bond, and the scope of responses is limited. Furthermore, they have a clear and predicted behavioural pattern including respect responses. This is required because of the true nature of the relationship: it provides some incentives but includes depressive, harmful and even deleterious elements as well. An interactor can be an integrator: an actor combining the service packages offered by a number of modes, coordinating the activities, or consolidating single consignments. In the transportation business the common carriers are to give a neutral, non-exclusive, and non-restrictive multilateral platform for interactive service production. Hence, the number of relationships is necessarily large. The scope of behavioural activities is presumed to be larger if the role is that of an (pro)actor rather than a reactor who is obliged to accept – at least partly - the stimuli generated by the initiator.

Undoubtedly, and with respect to pragmatics, all the actors tend to have multiactive responses to the proactive measures or the initialised effects, which means that they take, leave, reject, ignore, transfer, or stipulate, while acting, reacting, or transacting. Hence, they are not tied *to one form of response*. Indeed, it is possible to categorise different kinds of actions and reactions when coping with the question of responses in network e.g. Easton and Lundgren (1992) define five distinctive sequences: *reflection, adaptation, absorption, transmission, and transmutation*. Reflection occurs when an actor is rejecting the changes while

adaptation implies a situation in which change is managed by negotiations in the dyad not influencing the other members of the network. Absorption is close to adoption as a conceptualisation, since in this response the actor accepts the changes. In the case of transmission, an actor transmits the effects of change to the other members in the web whereas for transmutation it is typical is that the receiving actor adapts the changes but also transmits the changes – and the requirements and obligations as well – to the rest of the network. In general, Easton and Lundgren (1992) clearly distinguish between responses in a dyad and responses in a net or network context. In this study the main focus is on chosen dyadic relationships, and therefore the network reactions (transmission, transmutation) do not have a prominent role.

Position

Besides role, also the concept of position concept is one of the major constructs in the network theory. Position has been explicitly explained with different attributes like *identity* (Wynstra 1994, 803), *the role* (Anderssen *et al*.1994), *the importance* (Wynstra 1994, Halinen 1994, 326), or *the strength, characteristics and/or portfolio relationships* (Ford *et al*. 1998, 49), or *contribution to network* (Tikkanen 1997, Ghauri and Holstius 1996). In the organisational theory the position is explained with a group of models and respect attributes like *cohesion, equivalence* or *prominence* (Nohria 1992, 6). These concepts, and specially the last mentioned, are close to *the role especially through norms and expectations* (Aastrup 2003, 120). Moreover, position is not an absolute determinant but rather relative, meaning different things for different actors (Halinen 1996).

Consistent with concept of role, also position is generated through relationships. Mattsson and Johanson (1992, 211) postulate that ‘each actor is engaged in a number of exchange relationships with other actors. These relationships define the position of the actor in the network and further ‘the concept can used to characterise network structure and network distance between actors‘(ibid.). Interesting is the question of how the role could change because of new initiatives by operators and incidents caused by external stimuli. Also, the tasks and obligations are continuously changing, leading to new positions. Addressing the convergence of the terms we could claim, that, ‘the role dimension represents the subjective and creative character of the actor. Moreover, an actor has a position but acts in a role‘ (Anderson et al. 1998, 172). It seems also that position as a term has dominance over role in network studies (Halinen 1994). Accordingly, the conceptualisation determines ‘to what extent an actor is involved in the

(exchange) relationship and how much responsibility it has'. Furthermore, it is an expression of 'breath of the relationship' implying thus a range of activities and behavioural responses (ibid.)

With these two terms we can also embrace the dynamical aspects of the network. In this study both position and role can refer to change; a new position can be regarded as the actors' attempt to change, redesign and extend the traditional role. Though the proposal seems to be in contrast to the definitions presented by e.g. Halinen (1994, 252), it is in close accordance with her explanations, because for her the term role also includes '*potential to develop and expand the relationship*'. The role includes an option to modify the relationship, which changes the position as well. Moreover, it sets the limits for the behaviour. Furthermore, considering dynamics, '*dynamics in any one network will be unique relative to other networks.'* In other words, the question of position is in accordance with the idea of context-bound phenomenon. Besides, '*the ability of actors to interpret changes and to create meaning of their own and other actors' network positions and roles, is a primary determinant of their subsequent activities and thereby of the network dynamics'* (Halinen 1994, 253).

As noted above, and considering the parallels of these terms, we can not deny the fact that we deal with a context-bound phenomenon. Because of the influence of the structural elements of the network we are obliged to analyse how the actors are embedded in order to understand the position. Conventional evaluation of how an actor is related to other actors is not proper, since it rejects partly the question of embeddedness and the inherent dimensions.

The question of the potential discrepancy between these two terms is interesting since some scholars tend to define solely the role in order to capture the dynamics along with the suggestion that actually the position refers to stability (see e.g. Halinen 1994, Anderson *et al.* 1998). Basically, this dilemma is based on the examination on what the major antecedents and prerequisites for analysing the terms are. If a position is a reflection of structures, and not of interaction processes and inherent relationships, the conceptualisation carries out very strong stable aspects. Theoretically interesting is the question of what the major attributes of the position concept are. As noted above, the primordial question is whether the actors get the roles because of their positions (and because of the structural elements in a network) or whether the roles are created through the interaction processes. In this study the roles are created through the relationships, but they are also an outcome of the structures, whether these are social or others. The role also includes the limits for the behaviour, while the position is

rather an expression of the actors will, subject to the most appropriate interorganisational location in the future.

Aastrup (2003, 132) defines network positions as *sensitising concepts*; they are the actors' base for acting in network structure, which means that the question is how an actor relates to the network structures, which enables and constrains the actor in future *activities*. Moreover, in his view more attention should be paid upon analytical matters, instead of theoretising without any practical relevance. We also have to accept the pluralisms of terms and definitions amidst the practitioners as well.

From managerial point of view a position is a strategical tool, when a (focal) firm's one or two property/ies, character, or target - e.g. capability, reputation, identity, attractiveness, service quality, productivity, - is related to others; as Mattsson and Johanson (1992,231) put it '*strategic objectives are defined in terms of network positions*' and '*strategic actions aim at influencing actors, relationships, and network structures*' Referring to the extended conceptualisation of positions', strategic action '*may also aim at restructuring the web of dependencies (in the productions system)'*. As a result, weakening dependency and strengthening interdependencies are evident. Moreover, position means how a single operator operates in relation to others through the relationships created in interaction. To address the managerial approach more closely, position could also refer to need for organisational segregation, and thus to interorganisational proximity: how a firm as an actor distinguishes itself from others in terms of service, product, quality, reputation or identity. In order to maintain the difference, and superiority, consistent identity is required as well as continuous, perpetual analysis and observation for maintaining and protecting the position. Complementarity means modest distance, where as compatibility can be a trigger for starting a deeper collaboration.

In all, with the position interorganisational location in relation to other actors in the network is defined. The deeper the relationship the closer the actors tend to be, which has an impact on their network positions as well. Accordingly, position is appropriate expression of proximity. In this sense position can be associated with questions of spatiality with main emphasis on the closeness-remoteness-dimension and on spatial embeddedness (see e.g. Anderson *et al.* 1998 or Nikkanen 2000 for more discussion).

The position enables the actors to create strategical solutions; it can be a critical element in strategic planning, because it gives the focal firm a bundle of attainable locations in the network of relationships. The locations are continuously

changing in time, which refers to evolutionary processes in the relationships. Hence, in the networks, in which profound changes occur in a relatively short time, a temporal analysis is a prerequisite for the scrutiny. Regarding the evolutionary characteristics of the networks, e.g. the use of the life cycle metaphor has been often employed by researchers when temporal dynamics has been assessed, though several other theories could be more recommendable (Halinen 1996, 65). The strategic performance based on specified position is evaluated and assessed by another party, including historical experience and future expectations (Håkanson and Snehota 1997).

Mattsson and Johanson (1992) enlarge the theoretical discussion of the position by launching two additional terms, *micro and macro* position. Micro position refers to the *strength of the relationship with the other firms.* With macro position Mattsson and Johanson (1992) define '*the functions performed by the firm for other firms specially when exceeding the expectations'* meaning also the relative importance of the firm in the network, and the strength of relationships with other firms. Furthermore, macro position is an expression of the identity of other firms with which the firm has direct and indirect relationships (ibid. 213). There is also a *limited and extended definition* of positions (Mattson and Johanson 1992).

Because of the fact that position is often a reflection of network structures, *the degree of bonding affects* the position as well. This means that if there exist strong and well-established bonds between the actors, the positions are quite stable despite of efforts for change; this seems to be typical for IM chains. Position changes are also strongly interlinked (Wynstra 1994, 804). A residual change in position can lead to a *domino-effect*: despite of the bonded structures all the actors have to react by means of adaptation caused primordially e.g. by an external stimulus. Position could refer to an array of possible and attainable locations in interorganisational space-time -horizon, occupied by the actors often, but not always, for strategical reasons (as the strategists claim). The position is often it is *an expression of an actors will, subject to an ideal organisational location in the network;* that is among the web of relationships. Hence, positions can be expressions of an ideal state amidst relationships manifesting the actor's strive for repositioning itself - constrained, however, by e.g. structures like structurally bonded nets/network.

As regards practical verification, it is a challenging task for the researcher to analyse this term comprehensively. As Aastrup (2003, 122) puts it *'(...) the concept of position may involve several underlying dimensions (i.e. resources and resource dependencies as well as expectations and roles) making it hard to define the concept in operational terms.'* Moreover, instead of aiming to explain

the term/s properly we should pay attention to other interests:' *it makes more sense to ask what the concept of network position directs our attention to and what operative phenomena to measure, identify or explore network positions through'* (Aastrup 2003, 130). Though the additional components mentioned (micro and macro; limited and extended) enrich the theoretical discussion, analytically these proposals as extensions do not contribute to the research work by giving totally new mindsets for empirical verification (see also e.g. Aastrup 2003, Halinen 1994, Anderson *et al.* 1998). Hence, the relevance of modified terms can be modest in empirical investigation. Finally, and because of the fact that the role and position are different facets of the same phenomenon, we have to accept that there is *an interplay and dualistic interdependency between the concepts*. In other words, we should make an attempt to break the established setting in which there are two major explanatory chains for the definitions: role – processes – dynamic dimension vs. position – structures – stabilising dimensions. Anderson *et al.* (1998, 184) have even created a combined construct – *position-and-role*. On the basis of a case they postulate that '*position (is) encapsulated through expectations (…) and role, including (…) intentions, interplay and mutually create the dynamics in business networks*' (comments in parenthesis added). Figure 2 illustrates the dualistic nature and the interplay between these two concepts (based on Anderson *et al*. 1998)

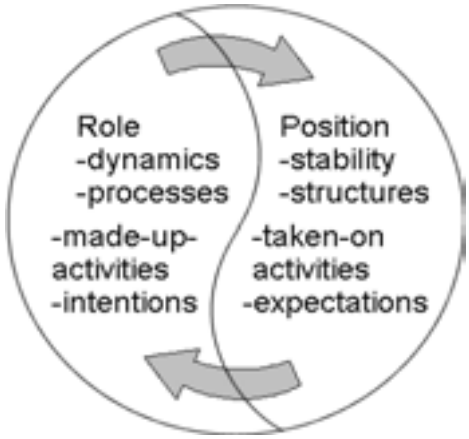


Figure 2. The Bipolarism of the Role-Position Concept

What comes to roles in particular, the structural perspective is emphasised in this study, when analysing the behaviour: the roles are perceived and defined by the operators of the focal net and they are thus consistent with the expectations. Thus, we do not stress the dynamical aspects of the role behaviour as much as some others do when they refer to position and discuss the stable determinants: e.g. Anderson *et al*. (1998) aimed to grasp the subjective and process-oriented character of the actor's creative nature when exploring the role.

The question of accepting expectations can be associated with the major theoretical roles as well. Typical responses for the reactor are those which take place subsequent to prior activities initiated by the counterparts. Inevitably, the role of an (pro)actor is more subject to own attempts and will than the role of the reactor.

Empirical evidence

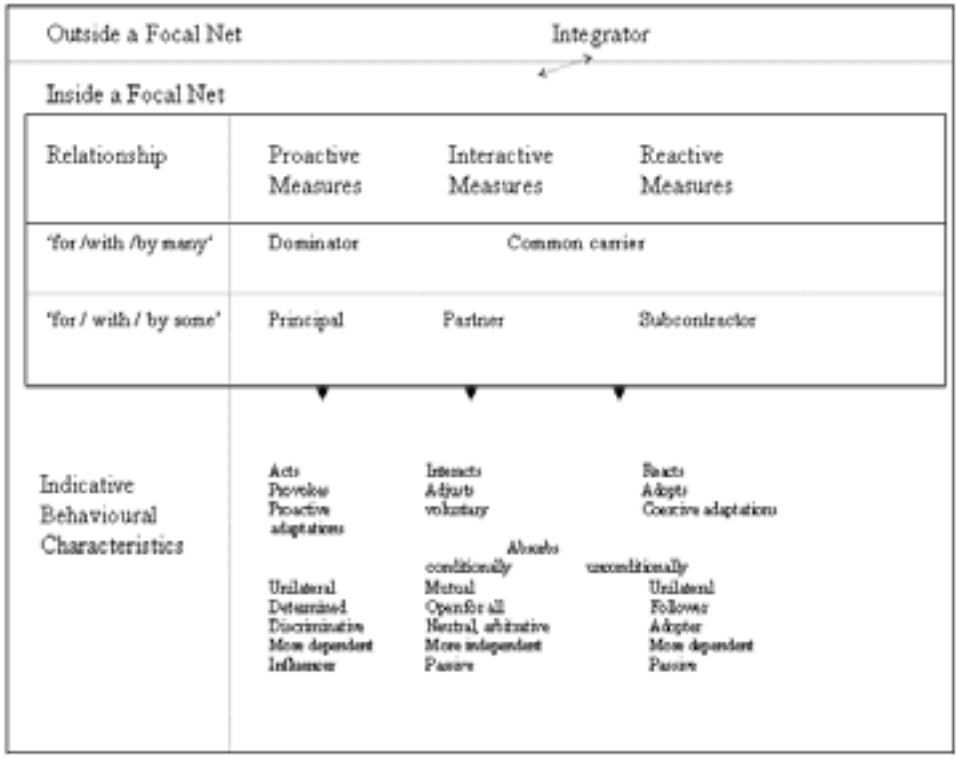
In this chapter, some interpretations of the roles of the railway company are explained on the basis of an empirical analysis conducted among the members of the focal net. The research work was done using both broad themes and more accurate semi-structured questionnaires in preliminary interviews (totally 15 informants). Considering the taxonomy, it should be noted that the roles are partly overlapping and the nature of the distinctive responses is not clear-cut. Besides, an actor can have *multiple roles simultaneously in a broad network structure*. On the basis of the empirical verification it is evident that VR Cargo as a focal firm can have different roles in different relationships. In practice, VR Cargo can be both a contractor and a contractee, having activities, which are typical for both to a subcontractor and to a principal in one specific relationship.

The classification criteria applied in the typology are ***twofold***. The ***first*** question is whether the focal firm deals with *one counterpart* (implying a dyadic relationship) *or* do the VR Cargo *exposes itself to a range of relationships with all the members in a network*. With the ***second*** criterion we approach the question of what is the *major nature and character of the actions, reactions, and interactions as responses in general.* Because of the fact that plural, diverse, and even inconsistent type of roles exist in a wider context, the classification of the role by means of a typology is a generalisation, and can not be appropriate in every detail. The roles as described in this chapter appear mostly in a dyadic relationship with a road carrier: the entirety of informants was rather heterogeneous with dispersed primary business areas. These dyads are the most distinctive ones in

railbased intermodal solutions, since a combination of two modes – rail and road – is often the major combination in intermodal freight.

In table 1 below the identified roles of a focal firm are explained by means of a typology using descriptive terms for the identified roles. The measures mentioned are simple indicators of the respective roles.

Table 1: A Taxonomy of the Roles of the Focal Firm in IFT



In next, some typical features of the identified roles are discussed more accurately.

Integrator

Particularly, the role of an integrator means, that a carrier can be a Multimodal Transport Operator (MTO) in the strict sense. Typical for MTOs is that they are engaged in transportation activities, typical for which is the transfer of goods in door-to-door- conditions. Practically, we can assume that the role of the TPLs (Third Party Logistics service providers) is to offer a wide array of services by integrating a single carrier's service, and subsequently, sell these services to the clients. It is thus evident that a single operator carrying out the responsibility of a MTO actually takes responsibility of the whole transportation process covering all the modes. Often the megacarriers as service providers are willing to enhance their traditional business performance with new initiatives. Thus, transportation, tied up to haulage in one specific leg, can be enriched by value-adding activities. A virtual integrator is presumably possible, though not verified in this study. The integrators are often not direct members of intermodal freight transportation chain but rather service providers or consolidators in general. Basically, there are two different paths for taking the role of an integrator. A carrier can expand its conventional business area by taking care of new VAL (Value Added Logistics) activities and subsequently providing these service packages to their own clients, or a freight forwarder can combine the services provided by the different modes and sell the entity to their own clients, which implies consolidation. The role of the service integrator is interesting, since it is proposed that this role is not *truly* performed by *any* operator in IM business (cf. Gröhn 1998).

Dominator

With this role a railway company attempts to be a leading-edge company in some specific fields, thus provoking the net members to substantial configurations in their practices regardless of the fact that often the dominator takes the full advantage of the initiatives; this is often both an injunction, an imperative for the operators, and unilateral action. This is not necessarily consistent with the internal norms and practices once created, implying strong hierarchical governance. Significant is the notion that this role can be appropriate for all the network members. Though the focal firm was interested e.g. in developing advanced technology (EDI-based solutions, RailTrace system for tracking and tracing) with robust determination, the role of the dominator was not clearly found out. Though mainly an obligation, there is also a positive aspect to this role. A dominant role in a chain – if coupled with the subrole of an initiator – might *generate positive attraction* among net members for improvements and new acts. Espe-

cially the stakeholders agreed that the focal company should take a *more active role* in terms of investments, resources and other commitments. To characterise this type of behaviour, we claim that the focal actor's attractiveness is high; it absorbs interest, which is mostly a positive phenomenon. Nevertheless, a dominator can also be non-attractive, or non-appealing because of the strong relative bargaining power over a large number of network members. An actor can, however, trigger out the development. This specific role requires recognised prestige, supremacy, and superiority causing authority within a network. Other typical features of this role are size, power, technological prominence, and strong network identity, which all awake interest among other participants and operators.

Principal

Although principal is mainly a legal concept addressing the importance of the contractual bond, in this study this particular role is defined differently. It is *a determined and proactive course of action in a dyadic relationship, in which the railway company either strongly and unilaterally* or *modestly influences the decisions made in the relationship*. Moreover, the network member is recurrently or slightly obliged to adopt certain types of activities or practices in order ensure the continuity of the relationship, which indicates compliance. On the other hand, and especially in the long run, there are plenty of benefits and rewards for the other party as well, which make this kind of relationship appealing and increases its attractiveness. It is also assumed that the counterpart considers the propositions and initiatives as they are; these suggestions are later converted to new activities. Hence, the created relationship is an *asymmetric* one in terms of bargaining power, control, pace in developing the business relationship, and governance, which bring better outcomes for the principal. In general, the principal has slight dominance over another. In this study it was found out that this *role was not prominent*, since the role of the focal firm is so strong that to move the role to a different position is difficult and often not even aspired for.

Common Carrier

The term common carrier has many connotations, depending on the context where it is applied. Mostly, it is a legal concept in some jurisdiction, e.g. where common law doctrine gives a solid basis for legal matters. In this study, however, the term denotes a specific role having some special characteristics and respect indicators. It was verified that the *status of the common carrier is a major role for a focal firm in the network context.* In this sense, this specific role is a re-

flection of the network identity. Defined in this way, the role is strongly in accordance with the expectations perceived and declared by the focal net members in the interviews. Based on this specific role the focal firm *expresses its involvement* in the IM network.

Partner

As the role of the common carrier was rather evident for network relationships, a partner can be defined to describe reciprocal co-operation under pairwise *relationships.* In this study the partner is a concept which refers to *equal collaboration between a focal firm and its counterpart in a dyadic relationship in terms of risk sharing, investments, and efforts.* Many of the relationships are actually dyadic by nature. This means that though a common carrier is an expression of a network identity, this network role is also a basis for arranging dyadic matters. In all, the characteristics of the common carrier type of behaviour are transferred to the role of a partner. The focal firm's counterpart presumes that the principles and policies which are typical for a common carrier are also valid and applicable in the dyadic relationship.

Often the outcome of long mutual interaction is that the partners gain a certain degree of stability, which means, however, that both potential rewards' including the success, and conflicts are present. Collision of interests is natural, especially if the partners represent potential rivals in the long run.

Subcontractor

In general, subcontracting refers to unequal distribution of power, and has a strong legal connotation. In the role of the subcontractor, the counterpart explicitly or implicitly presumes and insists that the activities made by the focal firm – even short run episodes – are more or less reactive in nature. The focal firm continuously responses even in a slight manner to initiatives made by the network member. In all, it is expected that VR Cargo should adopt new kinds of solutions, if it is willing to co-operate in the long run. These reactive measures are a necessity, since a collaborator expects some form of a signal because of their own proactive measures. In the embryonic stage of the relationship, there are just a few, discrete transactions, but later both parties express willingness to co-operate more closely. Later, the integrative efforts are an assurance for deepening the liaison. Because of the long co-existence, the roles are stable, and they indicate an asymmetric relationship: the IM service provided by the focal firm is just indirectly affected by the needs of the final customer. It is possible that with

the same client VR Cargo is both the subcontractor, or contractee (e.g. providing linehaul for containers) and contractor (e.g. buying delivery service in short pick-up deliveries).

Conclusions

It was theoretically suggested that the dual term of position-and-role can be employed in the empirical analysis. Subsequently, it was found out that the major role of the focal company in the network context is the *common carrier*. This role contains some typical characteristics like rather open disclosure of the visions expressing focal firms' strategical will attached by a stable and predictable organisational behaviour. Most important is the notion that the focal company is neutral for all the other operators, and willing to enhance and strengthen collaboration with all the members in the IM network. This also means, that all the other members of the network are equal in terms of customer satisfaction. Besides, the adjustments intensify the captured role. The focal company is also tied to its role since there is still a government-erected right to be the sole operator on domestic tracks. The roles of a dominator, principal, partner, subcontractor and integrator were also introduced. On the basis of the results of this study, a more detailed in-depth analysis is needed to clarify the details of the different roles, especially with respect to major behavioural indicators.

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Essay 4

Analysing Intermodal Freight Transportation through the Roles of the Operators: Case VR Cargo

Abstract

The main objective of this paper is to analyse and describe Intermodal Freight Transportation (IFT) through the roles of the operators; particularly the question of how a railcarrier is engaged in a network is under scrutiny. VR Cargo (a strategic business unit of the Finnish railway company VR Ltd.) is chosen as focal firm, surrounded by actors of the focal net. The different roles an operator may have, have been created during a long common history shared by the actors, especially in the case of intermodal networks. The presence of roles is embedded in the tasks, and the future is anchored to the expectations and intentions. Role as a conceptualisation refers to network dynamics, and to incremental and radical changes in the network, in a similar way as position - a different facet of the concept of role - refers to stability and to the influences of bonded structures. It is assumed that an actor might have different roles in the IFT, depending on whether the role appears in a dyadic relationship or in the network context. Besides, an actor can have multiple roles simultaneously in a broad network structure. In this study practical exposition of organisational roles was conducted with the help of in-depth interviews in the focal net, complemented by some theoretical proposals presented in the literature. In order to reveal the identified roles, a typology was created. The role of the common carrier, which was empirically found to be the major role of the focal firm in the intermodal network context, is particularly discussed. Other identified roles (e.g. subcontractor, partner) appeared mainly in dyadic relationships and stemmed from the network role.

Introduction

Intermodalism (IM) or intermodal freight transportation (IFT) have recently been intensively contemplated by numerous scholars (see e.g. Woxenius 1994, 1998, Bukold 1996, Adjadjihoue 1995, Muller 1995, Frybourg and Nijkamp 1998, Gröhn 1998, Tuimala 2000, Bask *et al.,* 2001, Aastrup 2003, Nikkanen 2003). Intermodal transportation has been conventionally defined as movement of unitised goods with at least two different transportation modes. This specific mode of transportation is interesting for scholars analysing interorganisational behaviour, since it is assumed that intermodalism can be viewed as a total logistics service offered by a network of different organisations. Accordingly, this form of combined transport provides a testing ground for studying the themes and dimensions of interorganisational behaviour more exhaustively. The required degree of co-operation is presumably higher in the network of dependent intermodal operators than in situations where single modes act. Actually, there is no real intermodalism without active participation of all the parties involved and without tight relationships between the operators and facilitators. The parties can be service providers (carriers, freight forwarders, transportation companies, port operators), agents, stakeholders (e.g. towns, regional associations), customers (shippers, receivers), or others (customs, even trade unions). In this study Intermodal Freight Transportation is conceptualised through intermodalism as follows: IFT as intermodalism is a form of interorganisational behaviour characterised by the physical movement of unitised goods with Intermodal Transportation Units (ITUs, e.g. containers, swap-bodies and trailers, even accompanying units as cargo), using more than one mode as performed by a network of operators. VR Cargo (a strategic business unit of the Finnish railway company VR Ltd.) as a railcarrier is the focal firm.

There is a tendency in Europe to support and develop rail-based intermodal transportation for numerous reasons, for instance for the sake of a better environment (reduction of emissions is achieved through a better balance between modes), congestion relief (the total costs caused by this effect), and safety (shifting traffic from modes with high accident rates to ones with lower rates; European Commission 1998). Nevertheless, the enhancement of intermodal transportation with railcarriers offering a pertinent catalyst for progress has been very difficult. In Europe co-operative organisations have developed intermodal transportation (e.g. combioperators, Intercontainer-Interfrigo (ICF), UIRR). In intracontinent container traffic, ICF is a dominant operator, whereas UIRR concentrates mainly on piggyback transportation. In Finland VR Cargo has launched

some domestic (Capital Area - northbound and v.v. with semi-trailers and containers) and international services (e.g. scheduled block train operations through the Trans-Siberian Railway) for intermodal purposes in close co-operation with road transportation companies, forwarders and other operators. However, it has been argued by many of the practitioners that on operational level poor profitability has been a problem. Sehested (1998, 37) captures the thoughts and attitudes of many of the practitioners when he claims that '*the truth is that nobody makes money with intermodal solutions today'.*

Objective

The main purpose of this study is to analyse and describe Intermodal Freight Transportation through the engagement of a railway company by examining the roles and position of a focal firm in a rail-based intermodal network in Finland. The concepts mentioned above can be regarded as expressions of the network involvement. Because of the fact that networks are sets of relationships rather than sets of actors, it is important to understand the value of the exchange relationships created through time and thus having a past, present and future. The roles are created during the long common history the actors share, especially when IM networks are considered.

The firms are engaged in the network as actors; the presence of roles is linked to the tasks, and the future is anchored to the expectations. In all, the roles are created because of the historical record the actors have, and because of events, tasks, and expectations. The relationships have a real state and an ideal state, having an impact on the roles and on the tension a dyadic relationship might have.

Though role as a term could refer to network dynamics, and to incremental and radical changes in the networks, in a similar way as position refers to stability and to influences of bonded structures (see e.g. Mattsson and Johanson 1992, Anderssen *et al.* 1994, Anderson *et al*. 1998), a more intricate conceptualisation will be suggested. As mentioned, intermodalism as a form of action is interesting, as it is assumed that intermodalism is a total logistics service, requiring synergic performance by a network of different operators. Thus, the phenomenon can be also an application area for discussing both the network development and the stability. The position is not only influenced by the role of the company - whether it be theoretically an actor, reactor, or interactor - but also by how an operator is embedded in the network.

Approaching Intermodal Freight Transportation

As noted, intermodalism can be interpreted as a network phenomenon tied up with various relationships. Furthermore, intermodalism is here defined not as just a phenomenon caused by the production system, but from a particular analytical angle as well: intermodalism is considered to be interorganisational behaviour represented by inherent (social) processes and structures (see Figure 1).

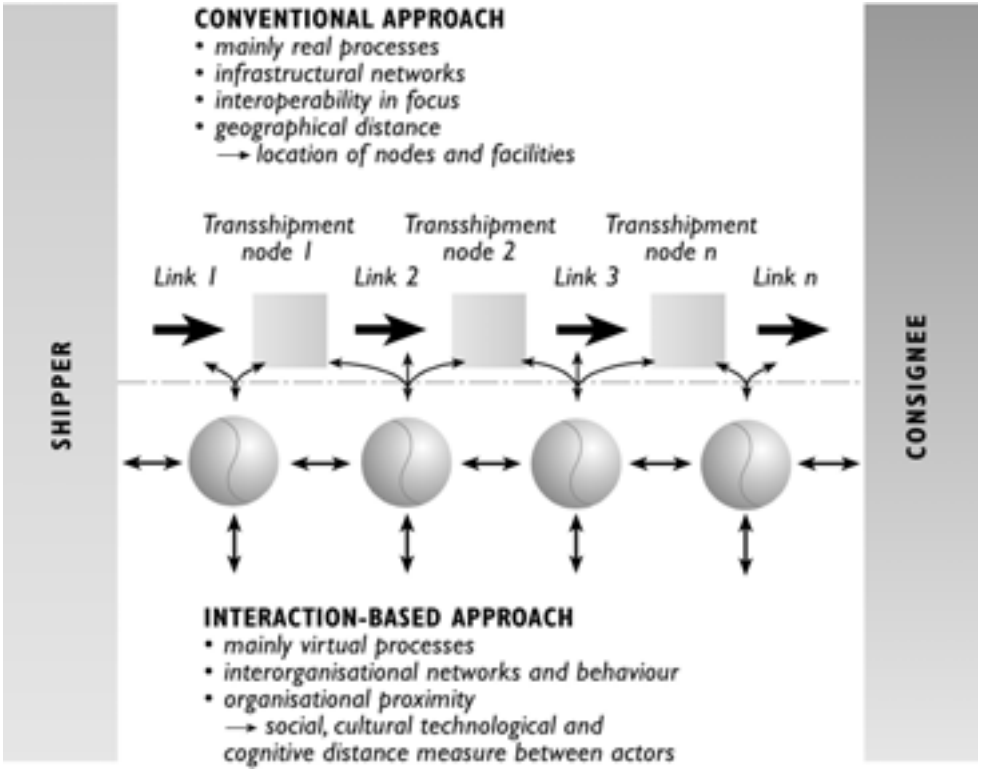

Figure 1. Different Approaches for Analysing IFT

Much of the research work on IFT actually relies on a technical-based orientation, which means that intermodalism is rather as a technical consideration in an infrastructural network with issues of interoperability under scrutiny. In order to expand the scope of interest in research work, more attention should paid to the interactive-based approach, emphasising the relationships between the operators, structural dimensions and addressing even the societal processes incorporated in them. It can be claimed that IFT is not just a question of how production systems create intermodalism (with the input-processes-output logic; compare to Woxenius 1998), nor a question of how networks produce it (compare to Aalstrup 2003). It seems that there is a need to complement the conventional approach from the explanation of 'real processes' (physical and concrete by nature based on business purposes) of moving unitised goods (of IFT) to the analysis of 'virtual processes', which often, but not always, take place in social interaction (e.g. organisational exchange, adaptation, and co-ordination).

The notion of how an IM network is created through the roles and positions the operators might have is important. The interfirm roles and positions represent the behavioural aspects of the interorganisational cooperation in contrast to the kind of analysis, where the physical processes and functions of transportation are mainly in focus. Accordingly, the roles/positions should be scrutinised instead of only the functions or technical processes that the operators perform. This implies that adjacent concepts, e.g. embeddedness as representations of behavioural terms can be valuable especially when social processes and structures are in focus.

Dualism of the Role-and-Position Concept

The terms *role* and *position* as concepts are associated with the analysis expressing two opposite forces: change and stability (see e.g. Anderson *et al*. 1998). In general, the terms are coupled with network relationships having a past, present, and future. These dualistic terms have a lot of theoretical parallels. Consequently, there is an interplay between them expressing inseparability*; 'they are actually different facets of the same phenomenon'* as Halinen (1994, 252) puts it.

A role can be defined as a task that is influenced by both the position of an actor in the network and how he is embedded in it, and more specifically, in nets. The role requires some plausibility in the network; it is thus important how the other members perceive a single actor through the relationships. Regarding the tem-

poral aspect of the concept, and emphasising the presence, a role can be expressed as a duty or a purpose of an actor in a particular activity. In this sense it could be an expected pattern of behaviour associated with an assumption or a presumption for the future. More accurately, and considering the future, it can be noted that a role – and more precisely a position – includes an idea of an expectation, and intention; e.g. Anderson *et al.* (1998, 172) use the term role *'to express (..) actor activities as* (these) *emanate from the creation and sense-making process that characterizes each actor's own intentions and interpretations* (comments in parenthesis added).

Role as a term can refer to a bundle of activities and tasks performed by an actor in IM transportation, influenced by the expectations – generated through and with the help of network relationships – of what is perceived as appropriate (compare to Anderson *et al*. 1998). It is thus an appearance for the network members based strongly on behavioural responses. With the role, an actor is required to accept an adoption of tasks according to an expected pattern of behaviour, while position more often refers to adaptation of tasks because of specific situations, and under different, more dynamical circumstances. Hence, an actor is ready to face a challenge of modified behaviour with respect to the role expectations. Consequently, the role is more a concept for analysing the behavioural aspects in the interaction rather than merely the expectations.

Though role is often associated with the change dimension in network studies (e.g. Anderson *et al*. 1998) or as Halinen (1994, 253) states *'the ability of actors to interpret changes and to create meaning of their own and other actors' network positions and roles, is a primary determinant of their subsequent activities and thereby of the network dynamics'*. However, in the IM network there is a strong tendency to accept and maintain the existing roles. Hence, the roles are not just an outcome in a long temporal process because of stable tasks in the network, but because of structures. Bundles of actor bonds (e.g. social, technological, co-ordination) and bonded structures in general are often prevalent within permanent relationships. As regards the role of the focal firm, it should be remembered that there is still a *government-erected monopoly,* which means that the focal firm has an exclusive right to maintain railway service on domestic tracks, implying a sole operator case. As such, there is an external obligation stipulated by the public authority to cope with certain transportation activities. The focal actor can change the position through pertinent role performance, although this is possible only in a limited scope; e.g. the role of the common carrier does not allow the focal firm to change its position radically.

In addition to role, also the concept of position is one of the major constructs in the network theory. The position has been explained with different attributes like identity (Wynstra 1994, 803), role (Anderssen *et al.*1994), importance (Wynstra 1994, Halinen 1994, 326), strength, characteristics and/or portfolio relationships (Ford *et al.* 1998, 49), or contribution to network (Tikkanen 1997, Ghauri and Holstius 1996). In the organisational theory the position is explained with a group of models and respective attributes like cohesion, equivalence or prominence (Nohria 1992, 6). These concepts are close to the role, especially through the norms and expectations (Aastrup 2003, 120). Moreover, position is not an absolute determinant but rather relative, meaning different things for different actors (Halinen 1996). It seems also that position as a term has dominance over role in network studies (Halinen 1994).

Consistent with the concept of role, also position is generated through relationships. Mattsson and Johanson (1992, 211) postulate that '*each actor is engaged in a number of exchange relationships with other actors. These relationships define the position of the actor in the network;* besides, *'the concept can used to characterise network structure and network distance between actors*'. Consequently, the tasks and obligations are continuously changing, leading to new positions. Addressing the theoretical convergence of the terms, it can be claimed that *'the role dimension represents the subjective and creative character of the actor.* Moreover, *an actor has a position but acts in a role'* (Anderson *et al.* 1998, 172). Accordingly, the conceptualisation determines '*to what extent an actor is involved in the (exchange) relationship* and *how much responsibility it has'* (Halinen 1994, 234). Furthermore, it is an expression of the breadth of the relationship*,* implying a range of activities and behavioural responses.

These two terms can also embrace the dynamical aspects of the network. In this study both position and role can refer to change; a new position expresses an actors' attempt to change, redesign and extend its traditional role, which means that the term also includes '*the potential to develop and expand the relationship*' (Halinen 1994, 254). The role includes an option to modify the relationship, which changes the position as well. Moreover, it sets the limits for the behaviour. Furthermore, considering the dynamics, '*dynamics in any one network will be unique relative to other networks'* (Halinen 1994, 252).

Considering the parallels of the terms role and position, it cannot de denied that a context-bound phenomenon is under consideration. Because of the influence of the structural elements of the network, it is necessary to analyse how the actors are embedded in the network in order to understand the position. The conventional evaluation of how an actor is related to other actors is not proper, since

it rejects partly the question of embeddedness and the inherent dimensions (e.g. social nets). Moreover, the term position is a valuable expression of organisational proximity, which means that the position can even be associated with the questions of spatiality with main emphasis on the closeness-remoteness dimension.

The question of the potential *discrepancy* between the terms is interesting, as some scholars tend to define solely the role in order to capture the dynamics, suggesting that position actually refers to stability (see e.g. Halinen 1994, Anderson *et al.* 1998). In this study roles are created through relationships, but they are also an outcome of the structures, either social or others. Position is often an expression of an actor's will, subject to an ideal organisational location in the network of relationships. As such, position can refer to an ideal state amidst relationships manifesting the actor's strive to reposition itself. Because of the fact that role and position are different facets of the same phenomenon, it has to be accepted that there is *an interplay and dualistic interdependency between the concepts*. In other words, an attempt should be made to break the established setting in which there are two major explanatory chains for the definitions: role–processes–dynamic dimension vs. position–structures–stabilising dimensions. Indeed, Anderson *et al.* (1998, 184) have even created a combined construct – *position-and-role*. They postulate that '*position (is) encapsulated through expectations (…) and role, including (…) intentions, interplay and mutually create the dynamics in business networks*' (comments in parenthesis added by the present writer). The following figure expresses the dualistic interplay between these two terms.

Figure 2. Bipolar Interpretation of the Role/Position Concept

As regards the dynamics caused by organisational roles and the adjacent pressure for changes in the chosen network, Anderson *et al*. (1998) aim at grasping the subjective and *process-oriented character* of the actor's creative nature when exploring the role. However, in the inter-firm roles of this study the structural perspective is probably prominent when analysing the behaviour of the operators. With respect to the structural elements of the IM network, it can be assumed that even inertia is evident, which means that this co-concept can be valuable in order to understand the terms of role and position. For some researchers inertia actually means unwillingness to change current organisational behaviour, thus maintain the existing roles (e.g. Ford *et al.* 1998). In the next chapter, organisational roles are discussed more accurately in their empirical surrounding, although actually a bi-faceted concept is employed (referring both to processes and structures).

Empirical Evidence: Case VR Cargo

Research Method

In Finland, the transportation of unitised goods by rail is performed by VR Cargo, which is a strategic business unit of VR Group Ltd. As regards freight transportation, Oy Pohjolan Liikenne Ab as a subsidiary of the Group, and more particularly Transpoint take care also of the movement of unitised goods. The Group is owned by the state of Finland. Intermodal freight transportation can be divided to international and domestic traffic. As regards international cargo, in eastbound traffic there is a regular container service from Finnish ports to St. Petersburg and Moscow and, in association with its partners, to Nakhodka Vostochny/Russia via the Trans-Siberian railway (TSR). The TSR connection for containers is based on the use of scheduled block trains. In year 2003 there was a huge increase in the number of conveyed containers, with nearly 100 000 TEUs. As such, TSR combines appropriately two continental markets, Europe and Far-East/Asia, which means that the operators in Finland, and more particularly in the local net offer services in transit traffic. The westbound drayage relies on the use of railferries, requiring co-operation with KN Nordic Rail through the Port of Turku (destinations in the Continent and v.v.) and SeaRail (destination Scandinavia and v.v.), also using the Port of Turku as a hub in Finland. On domestic tracks VR Cargo transports ITUs between Helsinki/Turku/Tampere/(Lahti) - Oulu/Tornio/Kemi. The service is performed in cooperation with some operators with whom VR Cargo has a direct or indirect relationship.

VR Cargo was chosen to be the focal firm in this study; the operators for whom the focal firm has created relationships constitute a focal net. As such, the perception of most appropriate relationships by the focal firm is important also in delimiting the scope of analysis; the '*net of direct and indirect interorganisational relationships that the focal firm perceives (...)'* (Salmi 1995, 455) can offer a basis for in-depth analysis. The scope of the focal net indicates also how far a firm can go (Parolini 1999, 67). Moreover, a focal net is also a *company's or management's perception of its context* that are within its network horizon more than a freely chosen group of actors (Salmi, 1995, Möller and Halinen, 1999). Reliance on the subjectivist focal firm's view on its own business context is thus important (Tikkanen, 1997, 595), meaning also that a '*company's network behaviour represents the company's interpretation of the rules prevalent in the network'*(Salmi 1995, 45).

In order reveal different inter-firm roles, interviews were conducted with practitioners representing the focal net members in two separate rounds. The empirical investigation consisted of loosely structured interviews with selected informants, and later – once the focal net was defined together with the representatives of the focal firm – deeper discussions based on a semi-structured questionnaire. In interviews the researcher, with the help of an open dialogue, aspired to support and encourage speaking rather than compel the respondents to use certain idioms and phrases. The gathered results were interpreted and analysed before entering next round. Many of the research acts were done simultaneously, and even in the reverse direction, implying a loop-wise procedure. The researcher aimed at making intermediate synthesis of the information that was in use at a specific moment. The total number of informants was 25, representing 15 different operators. The sample consisted of VR Cargo's major partners in intermodal freight transportation, which means that the operators account for the major part of the total revenue of the focal firm in domestic IM business. Some of the informants did not have any contractual bond with VR Cargo or any direct business relationship, but as their decisions and perceptions are important in general, and because they indirectly influence the traffic, they were chosen as informants (see also Nikkanen 2003).

Generally, a strong interactive and iterative aspect was emphasised throughout the empirical working process. There was no strict frame presented *a priori* by means of processual flow-charts, or similar, expressing tight causal links because of interactive phenomena. In this study conceptual vocabularies were addressed, rather than conceptual frameworks created *a priori* (compare to Pettigrew 1998). The aim was to avoid the 'WUAWUG- syndrome'. The WUAWUG syndrome (What-you/U-ask-is-what-you/U-get) is one of the obstacles for the researcher to get in-depth knowledge regarding the interactive issues that are under consideration. A pre-defined theoretical framework might force the researcher to use the wording, concepts and expected causality of the pre-explained model, including the use of appropriate vocabulary as well. A rather similar idea is described by Gummeson (1991) when he discusses a *procrustean science* - an idea derived from ancient Greek mythology - which refers to misuses of theories and models for formulating the hypotheses to be tested. When such hypotheses are used as the point of departure in research '*they govern the way questions are asked and the way answers and other observations are interpreted'* (op.cit., 55).

Identification of Roles

In order to find out different roles, a classification matrix was created; the criteria applied in the typology are *twofold*. *First*, whether the focal firm is coping with one counterpart (implying a dyadic relationship) or whether VR Cargo exposes itself to a range of relationships with all the members in a net(work). The second criterion deals with the question of the major nature and character of the actions, reactions, and interactions as responses in general. Because of the fact that plural, diverse, and even inconsistent types of roles exist in a wider network context, the classification of the roles by means of a typology is a generalisation, and can not be appropriate in every detail. The roles as described in this chapter appear mostly in a dyadic relationship with a road carrier. Moreover, these dyads are the most distinctive ones in railbased intermodal solutions, since a combination of two modes – rail and road – is the basis for intermodal freight. It should be pointed out that a net is actually under consideration, not an entire IM network. Presumably, the *network roles are* – if not totally identical - *close to the ones which appear in a focal net* (for this reason the concept *net(work)* is often used). In the description below the concept of role is discussed; however, this term refers to the dualistic concept of role-position rather than expresses the inter-firm role as such (compare to Fig. 2).

In Figure 3 the identified roles of the focal firm are explained by means of a typology using descriptive terms for the identified roles. The measures mentioned are simple indicators of the respective roles both from a behavioural and a functional point of view.

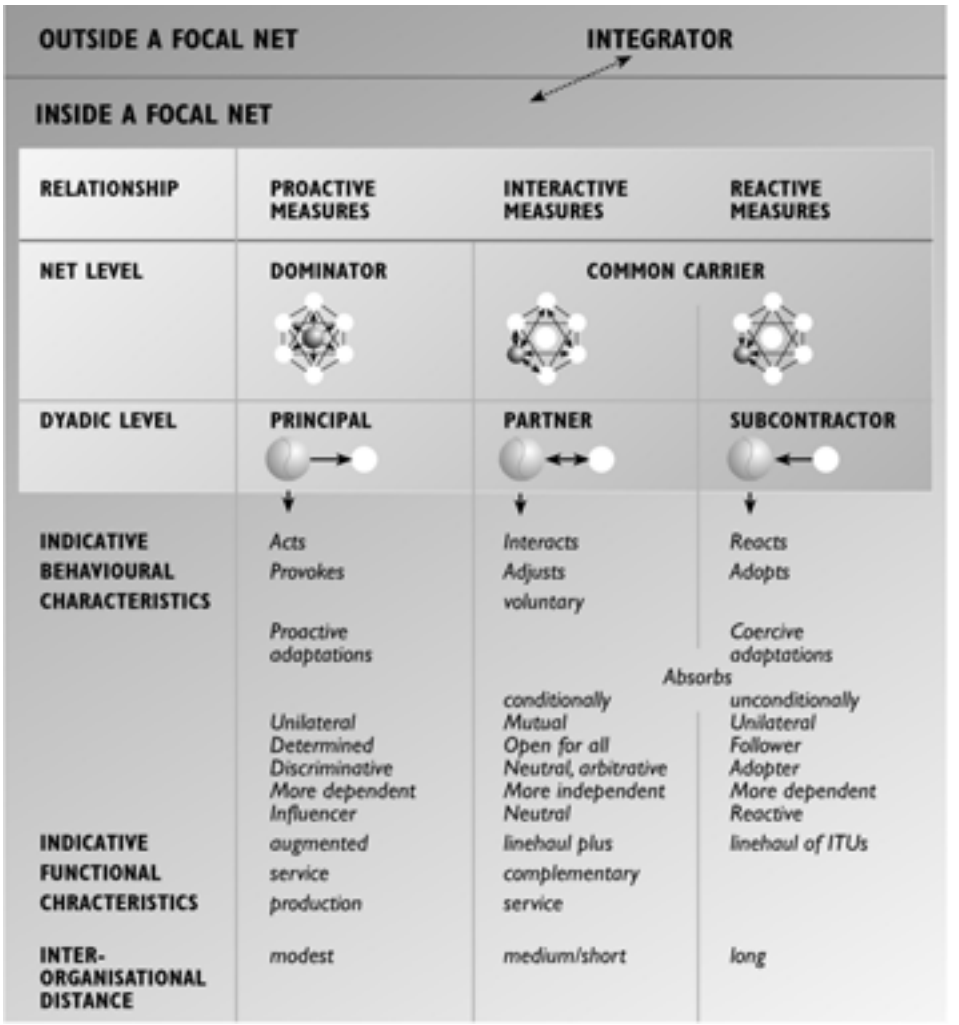

Figure 3. Conceptualised Roles of a Focal Firm in an IM Network

It can be suggested that the roles are partly overlapping and the classification has blurred boundaries. Besides, an actor can have multiple roles simultaneously in a broad network structure. Based on the empirical verification, it can also be claimed that VR Cargo has different roles in different relationships. In practice, and in different transactions, VR Cargo can be both a contractor and contractee having activities which are typical for both to a subcontractor and to a principal.

The role of the *common carrier* is a major role of the focal firm in the IM net(work) context. It is based strongly on internal intentions and aspirations; there is a robust manifestation from the management that the principle of neutrality is of strategic importance in VR Cargo's vision, which also implies a strong commitment to continue in the chosen course of action. This characteristic means also that the focal firm is open for all the network members, and willing to enhance and strengthen the collaboration. In order to maintain neutrality, the probability of conflicts of interest should be kept at lower level. Practically, this characteristic means also that VR Cargo is open for all the network members, and willing to enhance and strengthen the collaboration. More specifically, and because of the role's obligations, non-discrimination between customers is accepted as a prominent course of action.

As regards operational activities, cross-subsidisation in the pricing policy and the urge to utilise a limited number of basic equipment characterise the role. As such, the performed adjustments- whether technical or behavioural - intensify the captured role. Despite of the suggestions by the public authority to open the domestic tracks for free competition, VR Ltd is still a sole operator in the railway industry. Therefore, the strategic decisions made by VR Cargo are always subject to external constraints (see Fig.4 below).

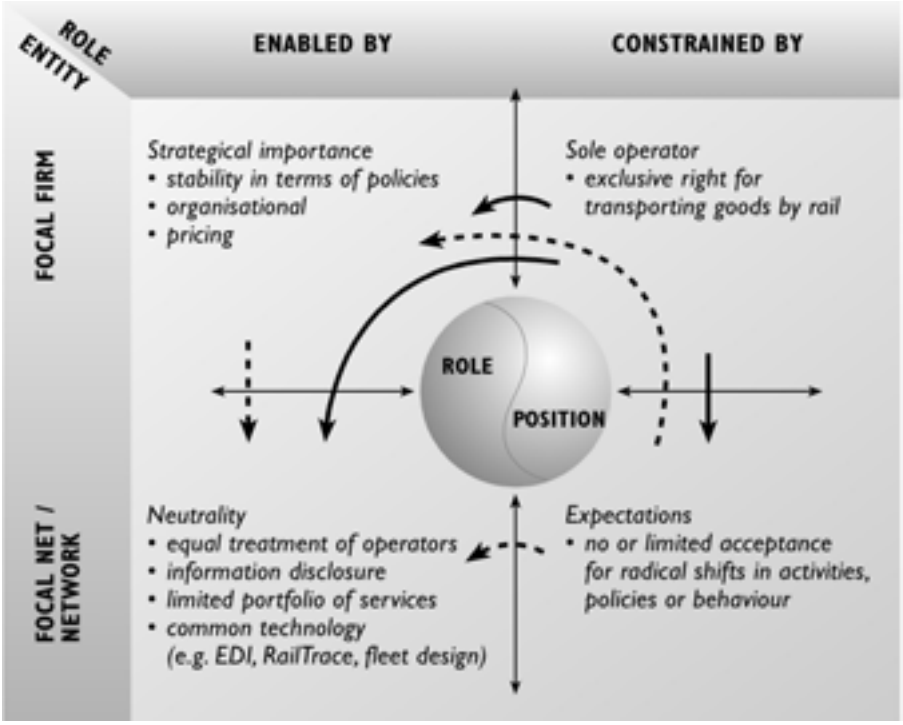

Figure 4. Characterising the Railcarrier as a Common Carrier

Regarding the functional elements of the transportation, the traction of wagons on some specific leg is typical for the focal firm embracing the role of the common carrier (see right-hand corner in Fig. 3). In a similar manner Aastrup (2003) defines the network position of a railcarrier (Railion in Denmark) with the help of *four* major elements: *first*, emphasising the role as a provider of traction in IM business taking some risks, *second*, being the dominant railway operator on Danish tracks, *third,* employing some advantages in terms of equipment and scale, and *fourth*, based on expertise and established relationships with other railway operators. There have been improvements in numerous matters by the focal firm, especially with respect to adaptability in technical issues. As regards e.g. redesigned marshalling yard operations and train forming, these particular activities aim at reducing the handling of single wagons and groups of wagons in favour of block trains. Regarding rail-road transport, VR Cargo has built ramps, rails and loading yards needed for loading and discharging the trucks. There are

also trail runs for a new wagon type, which can carry modular vehicles of over 25 metres in length, multipurpose wagons as a new construction for both ITUs and other cargo, and a prototype pocket wagon with lowered cargo space between the bogeys. Because of the fact that VR Cargo is committed to be a neutral service provider in IFT, it is obliged to utilise a limited number of basic equipment and fleet in haulage.

As regards the *dominator*, with this specific role the railway company attempts to be a leading edge company, thus provoking and coercing the other operators to substantial modifications in their practices. Often, however, the dominator takes a full advantage of the initiatives. The positive feature is that it might generate positive attraction as well. The introduction of some advanced technologies (e.g. implementation of RailTrace) express to some degree the focal firm's dominance over the others.

With respect to *roles on a dyadic level*, *principal* is close to dominator. It is a determined and proactive course of action in a dyadic relationship, in which the railway company either strongly and unilaterally or modestly influences the decisions made in the relationship. Moreover, the network member is recurrently, more or less, or slightly obliged to adopt certain types of activities or practices in order to ensure the continuity of the relationship, thus indicating compliance. On the other hand, and especially in the long run, there are lots of benefits and rewards for the other party as well, making this kind of relationship appealing and raising the attraction. *Partnering* in a pairwise relationship describes reciprocal co-operation, which implies equal collaboration between a focal firm and a counterpart in a dyadic relationship in terms of risk sharing, investments, and efforts. Often, there do not exist genuine partnerships; deep relationships are formed because of the need to avoid negative effects and harmful asymmetry in terms of power. Actually, partnering is an informal explanation created *a posteriori* for comprehending the nature of the relationship and inter-firm roles, respectively.

Under the role of a *subcontractor* the counterpart (e.g. forwarder) often implicitly presumes - or even insists - that the activities made by the focal firm are more or less reactive in nature. Generally, a railway company has no direct contacts with the end-users; these contacts trigger out the need for transportation. Hence, in combined transportation, most of the equipment development projects have been initiated by the road carriers, often based on the needs of their own customers. In IFT, the railway transportation service as an activity is based on the technical solutions of linehaul, complemented occasionally by loading, discharging, and terminal operations (compare to Fig. 3). Moreover, despite of the international connections, its international IM business, the railcarrier has a limited

geographical coverage, which means engagement in national service. Then the integrators prepare service packages for their clients offering the major linehaul transportation of ITUs for the focal firm.

In IFT, the term Multimodal Transport Operator (MTO) is widely applied by the freight forwarders and other third party logistics service providers, when they refer to their own responsibilities as consolidators or integrators. Characteristic for MTOs is that they are engaged in transportation activities, typical for which is the movement of goods in door-to-door- conditions. Practically, it can be assumed that the role of the 3PLs is to give a wide array of services by integrating a single carrier's service, and subsequently, sell these services to the clients. It is thus evident that a single operator carrying out the responsibility of an MTO actually takes responsibility of the whole transportation process covering all the modes.

The role of the *service integrator* is interesting, since it is assumed that this role is not truly performed by *any* operator in the IM business (cf. Gröhn 1998). Conventionally, the tasks and liabilities associated with this role are mostly connected to the freight forwarders, often also called consolidators, or NVOCCs. The practice of one-stop-shopping also refers to freight forwarders in their attempt to expand the business opportunities. Though of great interest, this particular role is not suitable for VR Cargo due to various reasons, starting from the idea that there is no clear, visible, and public statement from VR Cargo's side to support this type of a situation.

Conclusions

There are a lot of external expectations for the railcarriers concerning their performance in transportation industry. In Intermodal Freight Transportation, due to environmental concern and need for viable business models, the stakeholders would observe new activities performed by the railway companies with great interest. However, the roles adopted by the railcarriers often delimit the scope of acts, enforcing them to take care of the traction of wagons in transportation chains attached with some minor augmented service. Especially in IFT, which is presumed to account for a greater deal in contemporary value chains for moving unitised goods, there are lot of impediments for successful growth because of the inter-firm roles, which appear either on net(work) level (e.g. common carrier, dominator) or on dyadic level (subcontractor, partner, principal). The network role of the common carrier influences strongly the other identified interfirm roles. The existing network structures, structurally bonded relationships and even iner-

tia influence the strategic decisions made by the railway companies in freight transportation. On the other hand, legislative constraints form an impediment for new activities. Most of the operators in the IM network claim that the focal firm should restrict its activities to the major ones and should not expand to new business areas. For this reason, there are plenty of tasks for the railway companies in their attempts to redesign their roles with new positions.

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Essay 5

Generation of Supply Networks through Sub-nets

Summary

This paper approaches supply networks from a structural point of view. It is assumed that the boundaries of the supply network are rather blurred than clear by nature. As such, a supply network is a constellation of identifiable sub-entities defined as nets. A net as a limited set of actors can be based on firms' interpretation of appropriate relationships. Moreover, the net can be geographical, having limited geographical coverage, or technological, where the common technology is the major tying element between the members. A triad is the smallest net theoretically possible, as it covers both direct and indirect relationships between three actors. Value nets and strategic nets as expressions on actors' intentions, and expectations are also presented. The objective in the first part of this study is to examine the variety of nets as discussed in literature. The second aim is to test the relevance of the suggestions in *empiria* by revealing the nets of BuyCom; this is conducted with the help of a single-case study.

Introduction

There has been a growing interest recently in purchasing and supply management to describe and analyse networks from a structural point of view. In this study a network is defined simply as a set of interconnections among actors*;* the interconnections can be relationships when the actors consist of firms or other organisations, but they can also be e.g. persons, teams or groups of persons working together. However, network as generic term is problematic as it is very difficult – even impossible – to depict its scope. Gadde and Håkanson (2002, p.184) claim that *'there is no natural network boundary – any boundary is arbi-*

trary'; there is no single objective network to be defined unilaterally. This means that is not possible to delimit the network appropriately as every boundary is artificial and there is thus subjectiveness in defining boundaries (Ford *et al.*, 2003, Parolini, 1999). Accordingly, networks are actually borderless; the dynamics stem from the fact that a researcher should always question the boundaries. Plenty of audacity and sensitive methods are required to create a clear picture of a network, and subsequently to model the network structure, due to the heterogeneity of the network actors and the infinite number of relationships (networks as sets of relationships rather than sets of firms). In order discuss the networks, whatever the approach, it has to be accepted that an unclear and dim concept is under scrutiny.

What comes to the genesis of networks, a *dyadic relationship* is a major element in the net creation process. As such, every (business) relationship exists both *per se* but is also embedded in a context through connections to other relationships (Holmen *et al.,* 2003, p.5). The network combines fragmented elements of different subentities, created through exchange relationships, which are tightly connected. Despite of the increased interorganisational resource dependence, fragmentation of larger industrial networks into smaller co-operative nets is evident in a broader scope (Tikkanen, 1997; also Cova *et al*., 1998).

Although there exists virtual coordination between the actors of the network, the description of how firms actually pursue network logic is difficult due to the complexity of the fragmented net(works). As Cova (1994, p. 280) claims reality as an organised structure is a pure illusion, which implies that '*everything is intertextual not causal or predictive'*.

From analytical point of view the network as a conceptualisation should not be a vague term for an indistinct block of firms working together. In order to describe network structures concisely, *a limited and specified set of firms (actors) can and should be examined.* As such, *nets* are smaller units of the entire supply network and they '*provide a lower level of analysis'* as Easton (1992, p.18) puts it. In this study *nets* are discussed more accurately, as they are essential for understanding the logic of networks despite of the fact that the entire structural entity from the supplier to the purchasing company and finally to the end-user is often difficult to model. Most firms have only limited knowledge of the final users of the services or products generated jointly by the net(work) members. They work together with counterparts in some smaller unit, with whom they have a close organisational proximity.

As regards particularly *supply networks*, there has recently been an increased tendency for analysing these networks with the interaction-oriented approach with selected entities in focus; especially the Industrial Marketing and Purchasing Group (IMP) has supported the analysis of the supply networks with e.g. strategic purchasing issues, relationship portfolios and limited constellations (Holmen *et al.,* 2003, Gadde, Håkansson, 2002).

Objectives

The purpose of this study is *twofold.* The *first objective* is to analyse the nets theoretically by looking at various suggestions for depicting the subentities of the network structure. The *second objective* is to test the relevance of the theoretical proposals in a real-life context. The empirical part of the study has been conducted by describing the various nets of BuyCom (the real name is not revealed); the single-case study serves a revelatory purpose considering the first objective. As such, it is important to examine how the supply networks are conceived and generated through diverse overlapping micro-structures in contrast to discussing how they are actually managed, which is probably not relevant nor possible in large global networks. Supply networks are conceived because of common intentions among actors and need to intensify the depth of mutual collaboration. As such networks should not be scrutinised on the basis of systems-logic (input-processes-output) and its simplified hierarchical reductionism.

In order to increase the understanding of the logic of the networks, special emphasis can be put on the *focal firm* as a point of departure for the discussion of focal nets. A *focal net* is often the point of departure in pragmatic analysis, not the supply network in its extreme scope. Moreover, if focal nets are to be analysed, network positions (and experience) emphasising the (probably) centrality of actors is important; e.g. how a single actor views its own position regarding also the positions of others, and the likely reactions are important characteristics in comprehensive analysis (Ford *et al.,* 2003). The following suggestions (Fig. 1) illustrate various nets in comparison with (supply) networks.

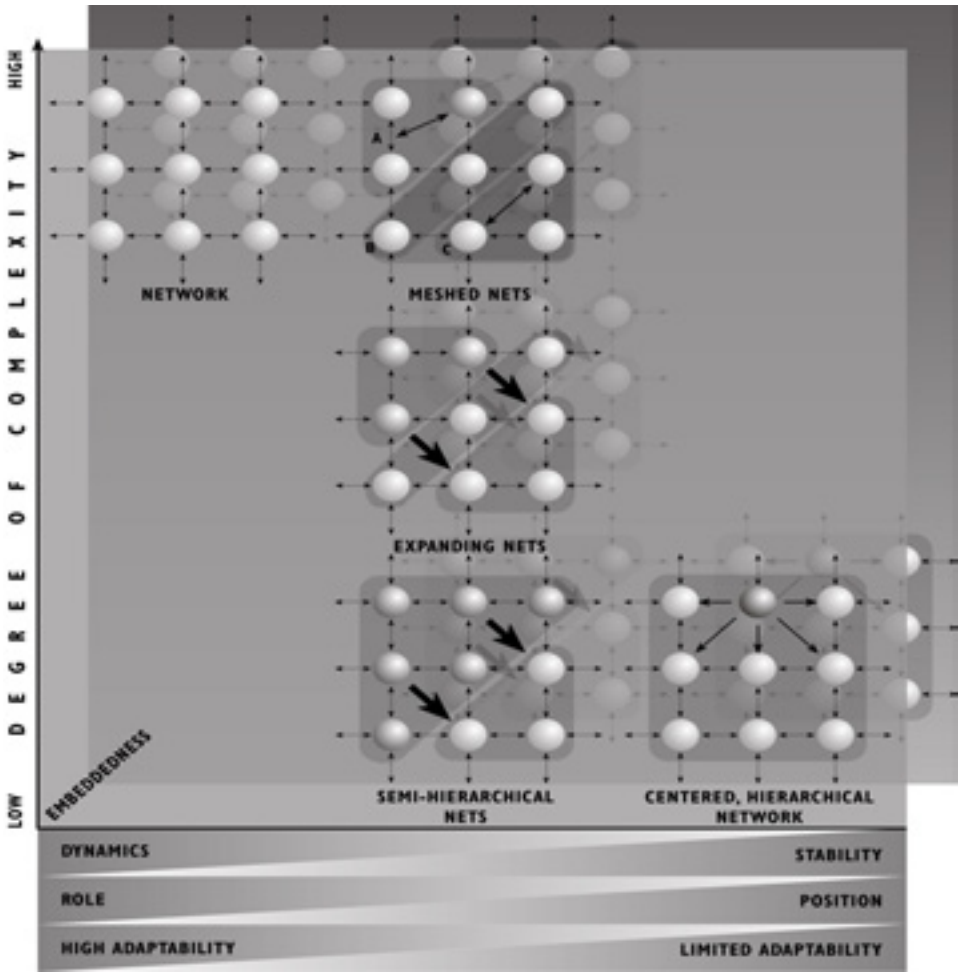

Figure 1: Network Structures

Network is actually a constellation of various, partly overlapping nets, which implies a clear conceptual distinction between the terms net and network. Tying elements, e.g. actor bonds, resource ties and activity links strengthen the interconnections and create a variety of relationships prevalent among the actors. In contrast to networks referring to macro, industry-level networks, a net is developed by intention and formed by a limited number of actors for a specific purpose.

The triad is the smallest unit of network in which both direct and indirect relationships are typical; a dyadic relationship contains just direct relationships. When nets are classified, the following *three* basic constructs can be identified: *first* the involvement of a third actor is gradually increased in a dyadic relationship between a seller and a buyer (practically in global sourcing e.g. freight forwarder, carrier, Third Party Logistics service provider (TPL), an integrator as a service provider; Area A in Fig. 1 above), *second* a triad as a sequential system (third party as a neutral intermediary; Area B), and *third* a triad between equals (three heterogeneous partners with different, though complementing tasks intending to work in a more co-operative way; Area C).

There are two generic triads, serial (no central actor) and unitary ones (central actor included), (Havila, 1996, Gadde, Håkansson, 2002). The serial triad (Area B) is an entity in which the core role of the intermediating actor is to mediate (Havila 1996, p. 36); in unitary triads the core role of this intermediary is unique and involves specific tasks. If the two links (relationships) from the intermediating actor to the other two actors are strong and at the same time the link between the other two actors is weak, a unitary triad can evolve. Theoretically, the network should not have any central or core actor dominating the performance inside the net limits, though recently e.g. integrators have been more active in expanding their business on the global market place. The launching of common information technology implying excellence over others can be a source of power in these interventions, providing co-ordination as well. In global sourcing situations the third party can be either an intermediary, working on behalf of the shipper or receiver, an integrator, or some other service provider.

The question of the role of the integrator has a lot of theoretical and practical debate in global sourcing situations (see e.g. Andersson, 1997, Berglund, 1997, Herz, 1993). In this sense, area A in Figure 1 illustrates triadic relationships appropriately. The integrator can be a standard service provider or a service developer. A standard service provider offers simple standardised services, whereas a service developer offers advanced value added services for each customer according to their specific demands. The customer adaptor takes over the customers' existing activities, thus improving the efficiency. The customer developer tries to offer new and innovative services.

As regards the local areas representing nets, some researchers use the term to explain the embeddedness of the actors because of the strong geographical aspects of all nets (Tikkanen, 1997, p. 70 footnote). Cova *et al.* (1998, p.206) distinguish between *two* types of terms which are conceptually identical but functionally different: *net(works) of proximity* (referring to spatial but also to cultural

and psychological proximity; close to focal nets) and *transterritorial networks* (global networks). Global networks can differ from local ones for instance by the density of contacts and their informal character. A local net can be a predefined territory with regional boundaries or an entity as a prompt fraction of the entire set of actors and relationships, respectively. The density and frequency of contacts can be a tool to assess the spatiality of the net(work)s of proximity and the cognitive distance measure. Social interaction provides a cognitive-based interpretation for limiting the extent of nets.

Social Nets

Embeddedness as a conceptualisation captures the impact of social structures for the net design. As such, embeddedness as a term refers mainly to the *social context* or *structures* in which the actors are embedded (e.g. nets), although some scholars offer a range of related aspects and dimensions for the concept (temporal, technological, spatial, political and market elements; Halinen, Törnroos, 1998), while others consider mostly economic and technological factors (Ford *et al*., 2003). Even hierarchial, multi-layer depictions with different levels around a core of the simplest bonded nets to tightest ones have been proposed (e.g. Törnroos, 1997, p.627-628). Embeddedness is predominantly influenced by the position of the actors in social networks of relationships. Gulati (1998, p. 295) has defined the elements of social context more accurately by using a simple classification to structural, cognitive, institutional, and cultural elements. However, a dyadic exchange relationship provides a basis; as Granovetter (1973, p. 33) suggests for discussing how actors are embedded *'economic action and outcomes, like all social action and outcomes, are affected by actors' dyadic (pairwise) relations and by the structure of the overall network of relations*.' With respect to social aspects and structures in general, Gulati (1998) stresses the importance of information and communication patterns in social behaviour.

Embeddedness can be also an expression of involvement in a net(work) in a general manner. Some scholars tend to define embeddedness in such a way that it refers *to involvement in local relations* and local nets (Oinas, 1998, p.52), though this is not a uniform and settled view, as some researchers include non–local aspects as well. In general *spatiality* is one of the major ingredients of the term (Oinas, 1998). The linking tie between social relationships and the geographical explanation is simple: most of the contacts, especially the informal

ones, are with actors who are close to the focal actor/firm; in other words: *most interaction is between participants having close organisational proximity,* which is often a reflection of geographical/spatial closeness. Furthermore, embeddedness can even be interpreted as involvement in the entire network (see e.g. Oinas, 1998) and not just in one particular subentity, e.g. a net.

Focal Net

The perception of appropriate relationships by the focal firm can be a key element in defining the limits for a net; e.g. Salmi (1995, p.45) defines a focal net as a '*net of direct and indirect interorganisational relationships that the focal firm perceives (...)'*. Accordingly, the boundaries are identified by the focal firm, and they are based on attitudinal and cognitive dimensions as well. The scope of the focal net indicates also how far a firm can go (Parolini 1999, p. 67). The term focal firm has been created, as in the present study, for analytical purposes, as pure networks have no centre or apex (Håkansson and Snehota 1997; see also Fig.1).

A focal net has just a limited correlation with physical proximity (Salmi, 1995). In general, a focal net is briefly a *company's or management's perception of its contex* that are within its network horizon more than a freely chosen group of actors (Salmi, 1995, Möller, Halinen, 1999). Reliance on the subjectivist focal firm's view on its own business context is thus important (Tikkanen, 1997, p. 595), meaning also that a '*company's network behaviour represents the company's interpretation of the rules prevalent in the network*'(Salmi 1995, p.45). Thus, the major task for the analysis is to capture those network relationships that might have considerable relevance, e.g. in terms of continuity, for the focal firm. A focal net can be local, national, or international regardless of the geographical borders between different areas; for Salmi (1995*)* a focal net has just limited correlation with physical proximity. A specified set of relationships recognised by the focal firm concerns both the extent and the basic structure of the net.

The extent of the focal net in relation to other nets depends on the strength of the role (and position) of the focal firm in its own net. From the focal firms' point of view, the question of whether or not to take full advantage of the (value) nets, depends strongly on the power that stems from its role/position (co-ordination by hierarchy). However, it is a challenging task for the researcher to analyse the impact of position for the nets comprehensively. As Aastrup (2003, p.122) puts it *'(...) the concept of position may involve several underlying dimensions (i.e. re-*

sources and resource dependencies as well as expectations and roles) making it hard to define the concept in operational terms.' Instead of aiming to explain the term/s, attention should be paid to other interests:' *it makes more sense to ask what the concept of network position directs our attention to and what operative phenomena to measure, identify or explore network positions through'* (Aastrup, 2003, p.130). Though additional components provided by some scholars (e.g. by Matsson, Johansson 1992 micro and macro vs. limited and extended), analytically these proposals as extensions do not contribute substantially to the research work by giving totally new mindsets (see also e.g. Aastrup, 2003, Halinen, 1994, Andersson *et al.,* 1998).

Because of the fact that the role and position are different facets of the same phenomenon, it has to be accepted that there is an interplay and dualistic interdependency between the concepts. In other words, an attempt should be made to break the established setting in which there are two major explanatory chains for the definitions: role–processes–dynamic dimension vs. position–structures–stabilising dimensions. Anderson *et al.* (1998, p.184) have even created a combined construct – *position-and-role;* they postulate that '*position (is) encapsulated through expectations (…) and role, including (…) intentions, interplay and mutually create the dynamics in business networks*' (parenthesis added by the present writer).

What comes to roles, in this study the structural perspective is prominent when analysing the interorganisational behaviour: the roles are perceived and defined by the operators in their own focal nets and they have a link to the expectations as well. Hence, the dynamic aspects of role behaviour are not manifested as strongly as some others do when they refer to position and when they discuss the stable determinants: e.g. Anderson *et al*. (1998) aim to grasp the subjective and process-oriented character of the actor's creative nature when exploring the role. The question of accepting expectations can be associated with the major theoretical roles as well. Typical responses of the reactor are those which take place after activities initiated by the other counterparts. The role of a (pro)actor is more subject to own attempts and implies also hierarchy e.g. in net design. The following illustration (Fig. 2) exposes the dualistic nature and the interplay between these two concepts, embracing the network influences.

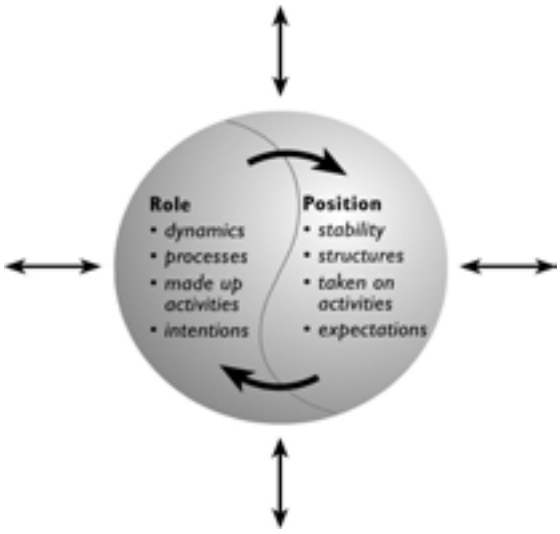

Figure 2 Bipolar Interpretation of the Role/Position Concept

Position can be regarded as a reflection of structural elements in a chosen net. An actor with a strong position (defined with the degree of centrality) draws virtual boundaries in its own focal net. This is conducted either individually or collectively (other actors can be subject to coercive reactions and adaptations).

Value nets

Value nets as sub-entities are intentionally formed coalitions in which the actors should have a specified goal, e.g. a common orientation towards innovation (Möller, Svahn, 1999, Parolini 1999). These nets are not just based on perceptions (as often with focal nets) but on common expectations as well. Despite of the fact that value nets are designed intentionally, there are some substantial differences between them. Möller and Svahn (2002, p. 2) distinguish between three (ideal) types of value nets: mature and stable nets (established nets), incremental development nets (emerging value) and radical, new value creating nets (emerging nets). Established value nets are based on specialised knowledge of each actor's community of practices, which means that the spreading of tacit knowledge is vital. There exist interpersonal trust-creating processes for

creating collective identity (cognitive actor bonds; multi-actor/cross-organisational teams; some persons as boundary-spanners).

For emerging value nets, typical is the tacit and dispersed character of ideas about new emerging knowledge structures. The actor's position in the nodes or participation in several nodes provides exposure for new ideas and increases both the envisioning and absorptive capacity. As regards integrators, the role of the impending integrator demands strong visioning capacity and attractive resources. Also a strong network position provides credibility. The core position can even be a fundamental element in net design. Integrated demand /supply nets can be constructed only when the underlying value-system has reached a prominent level of codiafiability, transparency and stability (Möller, Svahn, 2002). In complex vertical value nets, an integrator is needed because self-organising is conducted by hub firms to the first-tier integrators. There is, however, a problem because a hub as a (too) central actor can turn the net into a hierarchy (compare to Fig.1). Finally, in order to describe how nets can be managed, Möller and Halinen (1999) present strategic nets with four inter-layered components: macro networks, strategic nets, net *per se,* and relationship portfolios finally presenting the strategic relationships as outcomes. The strategic nets are created strategically and purposefully.

Case Study

The empirical part of the study has been conducted by testing the various nets of focal company *vis-a-vis* its counterparts in the supply network. BuyCom (BC) as the focal firm of the study represents food industry and develops functional and nutritional products both in B2B- and B2C-contexts. As an integral part of eight separate business divisions, BuyCom is an affiliate of BuyComCorp (BCC), which is a market leader in producing food ingredients and has worldwide geographical coverage also in purchasing materials and services. BuyComCorp employs about 8000 people in 40 countries. The annual net sales of the company were approximately 2.4 Billion Euros in 2003.

As regards strategic supply management, the responsibilities are divided between different levels (corporate, division, unit) according to the purchasing strategy, which consists of purchasing programme, purchasing organisation, and product and supplier management. On corporate level, BCC wants to reduce dispersion of random information and gather appropriate valuable knowledge e.g. by investing to other potential firms according to venture capital initials. One

of the major targets for procurement is to increase cooperation on division level in order to increase cost-efficiency, particularly when most of the purchasing on division/unit level is decentralised and takes place in the local context. Because there is an abundance of low-value materials in purchasing, the transportation costs account for a considerably high proportion of the total cost of acquisition on unit level. The supply net strategy as adjacent to value chain management combines internal procedures and external audit programmes for supplier evaluation. Besides traditional parameters, also areas of sustainability are considered, as well as supplier analysis. Critical success factors for the purchasing process in BC are *availability* (many of the materials have just one excellent source of supply) and *consistency of quality* because a supplier is obliged to comply with the high-standard quality criteria (ISO 9001, ISO 14001 and OHSAS 18001). With the help of supplier classification, BC aims at cooperating closer with those suppliers who can provide material which is strictly in accordance with the requirements set by the focal firm.

Identification of the Nets of the BuyCom

In the supply network of BC, the focal firm can be regarded as a core actor due to the reputation and prestige it has gained through years. With the help of the core position, BC could unilaterally expand the limits of the net; its strong relative bargaining power could give tools for re-considering the boundaries of various nets. However, typical for the position of BuyCom in the nets is that it intends to be predictable in terms of organisational behaviour, and thus reduce the risks stemming from over-reactive measures. Moreover, the focal actor rejects opportunistic type of responses offering a rather stabilising effect in the nets; generally speaking loyalty for the others is a part of the net design. What comes to the activities that are reflections of the net behaviour, there is some tolerance e.g. when deliveries by suppliers are not consistent with the contracts. A supplier is provided with opportunities to rectify a chosen course of action and a non-acceptable operational trajectory.

The interfirm role embraced by BC (as an expression of interorganisational processes in the nets) is essential in creating and enlarging the nets but is constrained by the structural elements of the other nets. The role in terms of power, size, technological prominence or capability can explain the bargaining power over the other nets but is of minor importance, though some other firms in the supply network tend to achieve a distinctive role that influences the layout of the

nets as well. In the focal nets created by the other actors there are intentions for expansion, though the nets are not managerially or intentionally planned or designed.

The prevalence of triadic nets (BC, forwarder, receiver) both in inbound supply and outbound deliveries is the basis of the net design in which the contractual commitments set limits for responsibilities and stipulate divisions of costs between the actors; because of the strong engagement in triadic relationships, there is even a tendency to exceed the responsibilities beyond the contractual obligations, which reinforces the strength of the net. Forwarders as integrators aim at designing their activities not just by consolidation of single shipments but also by co-ordination. The integrator-based nets share the same type of technology (e.g. tracing and tracking of transportation units, purchase orders through the Internet). Indeed, knowledge (explicit, tacit) can be one of the intangible resources for starting to integrate the nets by consolidation. An integrator as a central actor may establish information systems resulting in unified information flows (syntax, info structures). In general, the technological net of BC is not so relevant because e.g. SAP R/3 is used as common system architecture just on intraorganisational/division level.

Social nets influence the nets implicitly (triadic, local) through embeddedness. Behavioural responses, e.g. overreaction by the net members are channelled through personal relationships and they can be interpreted as hostile interventions causing disturbance for the net relationships. However, the effect is subtle and sensitive, influenced by the degree of social bonding: especially the impact of social relationships appears on the cognition and knowledge level. Mutual confidence is gained through personal linking both on company and personal level. Different forms of social exchange, like friendship or diverse spare time activities, can influence the trust creation mechanism, attachment and attraction. Even spoken words in interpersonal interaction expressing professionalism indicate trustworthiness (e.g. how arguments are explained and the promises based on them are kept). Communication either strengthens or weakens the social linkage between the two actors. The frequency and intensity of the contacts in communication at least force the actors to reconsider and re-evaluate the forces of the net design. Accumulation of the knowledge-base stems from the past and present incidents. Moreover, trust is an equal term for an exchange relationship influenced by the degree of social bonding, though too strong net(work) engagement in these nets is not a target.

Within the nets as basic constructs of supply networks (triadic, social, focal) there is an expected scope of organisational behaviour commonly defined by the

actors. As noted, overreaction e.g. in terms of unexpected adaptation may be regarded as negative. Nets are subject to risks and strong net identity causes some conservativism, which can be even perceived positively by the actors (established value nets and the impact of tacit knowledge). Some prudence in e.g. handling the arguments for utilising new innovations strengthens the collective identity created unintentionally by the net members. This partly prevents the risk of disengagement especially if a net-member represents a single source for the focal firm/other companies. Co-ordination is conducted not only with contractual ties but also with subtle tools. With respect to trust, there is evidence that a tendency to complement – at least partly – verbal agreements by other written rules and contracts which are subsequently reinforced by appropriate communication, is prevalent.

Every actor is vulnerable in terms of risks associated with the net presence, which means that the degree of intimacy has to be on a higher level. Accordingly, the nets can be defined as entities where the actors share common interests, and where they, based on internal norms, create common identity. Through netting (nets as sources for supply networks) the actors create a network identity which refers to some particular feature, character or activity which is recognised, interpreted and employed commonly by the actors and which, thus, implies net level segregation. Through common intentions, net identity labels the actors, which refers to trusted nets. The identity comprises some distinctive, unique and identifibiable features which give a means for recognising one particular net in relation to others. Some degree of cognition on whether the actor recognises and identifies the difference is needed for net segregation. Nets are tied up with diverse actors bonds; the strong bonding influences not only how the actors perceive each other but also how they '*form their identities in relation to each other*' (Håkanson, Snehota 1997, p.153).

Conclusions

In contrast to networks, which refer to macro- and industry-level networks, nets are often developed by intention and formed by a limited number of actors for a specific purpose, e.g. for increasing value. These nets are occasionally created strategically and purposefully (technological nets), though more often there can not be found any particular strive other than intentions. As most companies, BuyCom as the focal firm in the present explorative case-study is involved and operates in several nets. Triadic nets, especially in the case in which the in-

volvement of an integrator is increased in a dyadic relationship, are the smallest sub-entities of supply networks. The nets are also interwoven because the actors are involved positions in many nets simultaneously (spatial, social). In general, a limited and specified set of actors should be examined to understand the networks.

A supply network is a constellation, not just of actors and respective relationships, but also of various nets tied up with a number of interconnections. This network can not be managed; it is rather an outcome because of the processual and structural elements having presence in the subentitites. The focal net is a portfolio of the most appropriate and attractive relationships providing a context for a particular actor. Tight co-operation among actors (dyadic, triadic links) transform the traditional, robust network structures to smaller, flexible and more autonomous nets, in which the actors, intentionally, aim at increasing the value by multilateral means. Supply network is maintained with the help of appropriate social links that are intensified by collaboration on personal level. The question of how a focal actor is embedded in its outer surroundings is important for understanding the character of nets. Accordingly, e.g. utilisation of new technology requires intensive and new type of behaviour also on multiperson level. The exposal of various value nets (mature, incremental vs. radical development) gives new insights into understanding the strategic purpose of nets. As such value is created multilaterally, in strong co-operation with other actors of a selected net channelled through dyadic exchange relationships.

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Essay 6

Dealing with the Negative Effects of Network Engagement in Structurally Bonded Nets: Initial Empirical Evidence

Abstract

Network engagement contains both positive and negative effects for an actor. In this study the major objective is to introduce, both theoretically and empirically, responses for the negative aspects of network presence. In order to understand more deeply the non-desirable consequences, particularly conflicts should be analysed more deeply on every identifiable network level. Conflict can be defined as a strong disagreement on a certain, specific issue leading to substantial problems in the relationship/s either on dyadic (focal company *vis-à-vis* an operator), triadic (in case of intervention from a third party's side), net (e.g. focal or social net) or network level. In this study, a conflict is also regarded as a deep collision of interests in multiple relationships, causing tension and need to consider appropriate methods for reducing the stress of incompatibility. Activities can lead to an open clash as well. The actors can also deploy and spread some of the effects over the other network members. An unsolved conflict as a form of deep disagreement can lead to a total dissolution of a relationship, although in a structurally bonded network the risk is considerably low. In the empirical analysis based on subsequent, sensitive interviewing sessions, it was found out that the focal company of the study (VR Cargo) had a limited behavioural scope in the context of the study (Intermodal Freight Transportation/IFT) in order to reduce or eliminate interorganisational stress and to avoid open clash in the network. A suggestion for extending the theoretical discussion of negative effects under network presence is also provided.

Introduction

Firms as actors create and maintain business relationships e.g. in order to improve the conditions for higher performance. Accordingly, with the network engagement actors look for positive features. Considering the major assumptions of the network model, it can even be claimed that there is an emphasis on benevolent, co-operative behaviour, which means that the actors aim at mutual, rewarding goals. Furthermore, an intentional and voluntaristic view of human nature is highly addressed (Tikkanen 1997, 595). In principle, the actors can employ an exit strategy if enough rewards are not found in some particular network. However, strong actor bonds and other tying elements in the network relationships may prevent a single actor from leaving the network totally.

In a network, a single actor is faced with several harmful and negative effects as well. As regards burdens and threats, e.g. loss of control (unruliness), resource commitment, undetermindness (misdirected actions), exclusiveness and stickiness (the firm becomes connected with a whole network of other firms through a particular relationship) are some of the most typical ones; even deleterious effects can be revealed (Holmlund 1997, 135, Håkanson and Snehota 1997, 17-22, Andersson *et al.,* 1994, 6-11). On the other hand, synergetic performance, which is vital for the actors when they assess the rewards, can not be achieved continuously. In other words, a win-win type of manifestation including emphasis on the gets and yields, is probably not always valid, when the total impact of the network engagement is analysed. A win-loose outcome is probably more often the result, because the benefits in interfirm cooperation are not equally shared. Inevitably, the threat of a win-loose situation may be one of the major determinants for minor or reduced interest for reciprocal cooperation in the network. When the partners expose themselves to deeper collaboration, the probability of conflicts of interests is substantially increased.

Purpose of the study

This paper has ***two*** major objectives***. First,*** to conceptualise various potential negative impacts of network engagement, and ***second,*** to give preliminary empirical evidence of the means and methods created by the members of one particular network to avoid and handle troublesome effects and conflicts. The network analysed in this study is an Intermodal Freight Transportation (IFT) network, in which several modes - and organisations, respectively - are even

obliged to work in a closer manner. Moreover, VR Cargo (a strategic business unit of the Finnish railway company VR Ltd.) as a railcarrier is the focal actor encapsulated by the operators with direct or indirect relationship with the focal firm. The second task of this study is accomplished with the help of a case-based method, which means theme interviews, a semi-structured questionnaires and step-wise procedure in gathering and synthesising the acquired information.

IFT as a phenomenon called intermodalism is useful for a researcher in testing and analysing the features of network engagement. It is typical for these networks that various relationships are tied with multiple actor bonds, leading to structurally bonded networks in the long run. With respect to the strength of structural elements in the network, it can be assumed that even inertia is evident. It also seems that how the undesirable consequences are handled is based on the interfirm roles, instead of functions, of the actors on the network, triadic, or dyadic level.

As to the scope of the study, actually a *net* (focal net) is under consideration in the empirical analysis, *not* the entire network of operators. Nets are smaller units of an entire network and they '*provide a lower level of analysis',* as Easton (1992, 18) puts it. A focal net is briefly a *company's or management's perception of its contex* that are within its network horizon more than a freely chosen group of actors (Salmi 1995, Möller and Halinen, 1999), which implies that a '*company's network behaviour represents the company's interpretation of the rules prevalent in the network*' (Salmi 1995, 45). This means that a limited and specified set of operators (actors), and respectively the direct and indirect relationships can and should be examined. Because a net is actually under scrutiny in this study (instead of the entire network of IFT players and relationships, respectively), the concept net(work) is occasionally used in the text.

The following illustration shows the main area of investigation in this study (based on a figure describing relationship development by Ford *et. al*. 1998, 29).

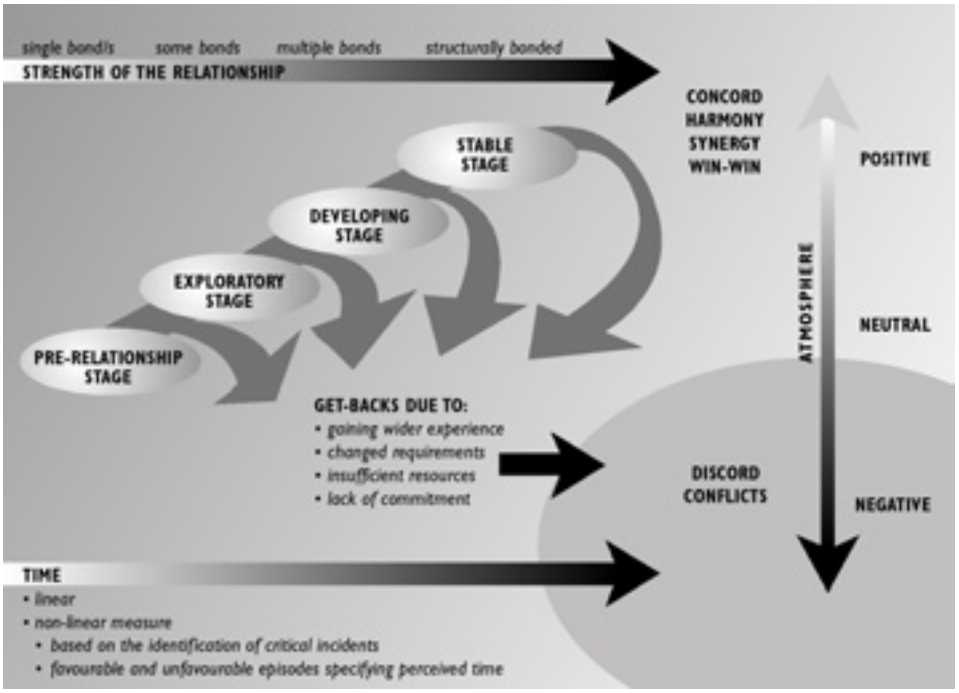

Figure 1: Development of a Relationship and the Main Area of Empirical Analysis

The area in the bottom right-hand corner expresses the major focus. In order to handle the conflicts, actors tend to create some internal norms. The norms are based on stable and robust interfirm roles, which means that many of the problems are associated with intentions and external expectations.

As to strong structural elements in a bonded network, it can be suggested that there is a linkage between the strength of the relationship and commitment as follows: strength of the relationship $\cong$ f(commitment) and commitment $\cong$ f(bonding). Furthermore, commitment = f(social bonding, structural bonding), in which social bonding = f(satisfaction, trust) (see e.g. Wilson and Jantrania 1996). As such the social elements and structures in one particular network (and e.g. embeddedness as a reflection of social nets) maintain the stability in the net(work)s.

Conflicts and power

Many of the undesirable effects in the network occur due to *conflicts*. Conflict as a phenomenon can be described as an opposition between two simultaneous but incompatible wishes, or overt struggle between opposing forces, e.g. individuals or groups (Jary and Jary 1999). Moreover, a conflict can be defined as an open clash between opposing groups or more simply, it is an incompatibility or disagreement about something important (see. e.g. Robertson 1988). A conflict can be defined as a *strong disagreement on a certain, specific issue, leading to substantial problems in the relationship/s either on dyadic, triadic or network level.* In this study, a conflict is also regarded as a *deep collision of interests in multiple relationships,* causing tension and need to consider appropriate methods for reducing the stress of incompatibility. Conflicts and deep disagreement can lead to a total dissolution of a relationship, although *in structurally bonded networks the risk is minor* (compare to Halinen and Tähtinen 2002). The actors are conscious of the risks that are associated with the network presence and they try to find conflict resolution methods and means for avoiding or even eliminating the threats. Competition can often be a source of conflict. An open conflict can also be a trigger of change, causing a stimulus to rectify a chosen course of action e.g. in a dyadic relationship; the constructive aspect can be emphasised and destructive aspects de-emphasised (see e.g. Argyris 1999, 122). Single conflicts in the society can even be regarded as a normal, not abnormal process (though not a positive one) (Robertson 1988, 519). Therefore, conflict is one of the major determinants of change and dynamics in a network. A well-working relationship actually combines co-operation and conflict (Gadde and Håkansson 1993).

Unequal distribution of power, on every identifiable network level (e.g. dyadic, triadic), is often one of the determinants raising conflicts and inconvience. In general, the power of the actors in networks is a versatile phenomenon. Power means partly an ability to co-ordinate. From the point of view of economics the invisible hand is stressed, though this can be just one of the ways to describe the mechanisms (Easton 1992, 22). Strong co-ordination can not be achieved by some grand master plan or quasi hierarchy: actors are too independent (though interdependence is feasible) and due to the diversity of activities, sole controlling by one actor is very difficult. According to Thorelli (1986), position is actually a location of power to create and/or influence networks. Accordingly, a position is dependent upon the power of the actor (company) relative to the other participants in the focal network. More specifically, the critical question is to what ex-

tent an individual actor can control the resources and activities of the other actors? The control over resources is an initial point for assessing the *power basis* and furthermore the *means of power* (e.g. activities to influence, threats, promises).

Interorganisational responses

The question of how a single carrier handles the negative effects in IFT depends strongly on its role, which varies when appearing on dyadic/triadic or net(work) level. It can be claimed that a bipolar interpretation of the role/position concept actually captures both the dynamic and stabilizing aspects of the network engagement, although the role as a conceptualisation grasps the subjective and process-oriented character of the actor's creative nature (Anderson *et al.* 1998, Aastrup 2003, Nikkanen 2003b). The behavioural responses are tied with the roles which appear on various levels in different net(work) contexts. Undoubtedly, and with respect to pragmatics, all the actors tend to have multiactive responses to the proactive measures or the initialised effects, which means that they take, leave, reject, ignore, transfer, or stipulate, while acting or reacting. Hence, they are *not* tied to one form of response (e.g. obliged to accept the effect as such).

In order to reduce interorganisational stress, an actor can *spread* negative effects, transferring some of them to others. It is possible to categorise different kinds of actions and reactions when dealing with the question of positive and/or negative responses in a network. Easton and Lundgren (1992) define five distinctive sequences: *reflection, adaptation, absorption, transmission, and transmutation*. Reflection occurs when an actor is rejecting the changes, while adaptation implies a situation in which change is managed by negotiations in the dyad, not influencing the other members of the network. Absorption is close to adoption as a conceptualisation, since in this response the actor accepts the changes. In the case of transmission, an actor transmits the effects of change to the other members in the web, whereas for transmutation it is typical that the receiving actor adapts the changes but also transmits the changes – and the requirements and obligations as well – to the rest of the network. In general, Easton and Lundgren (1992) clearly distinguish between responses in a dyad and responses in a net or network context. In this study the main focus is on chosen dyadic relationships (focal company *vis-à-vis* a counterpart), and there-

fore the network reactions (transmission, transmutation) do not have a prominent role.

Empirical evidence

As regards the operational Intermodal Freight Transportation in Finland, the movement of unitised goods by rail is performed by VR Cargo, which is a strategic business unit of the VR Group. As the focal company of the study, VR Cargo is engaged in both international and domestic traffic; e.g. the Trans-Siberian Railway (TSR) connection as a block train service is offered jointly by several operators. As such, TSR service combines appropriately two continental markets, Europe and Asia. The focal company still holds a position of being a sole operator in rail-based intermodal business. There are, however, some plans to reject the government-erected monopoly and to open the markets (and network) for freer market penetration. In IFT, there is an abundance of players on international (e.g. freight forwarders as consolidators, co-ordinators and integrators), national (shippers, seaports, dryports) and interregional levels (towns and municipalities), which all affect the decision-making of the focal company. As regards power issues in the intermodal network, during recent years the integrators have increased their attempts at interventions in diverse business relationships.

According to earlier analysis of IFT, there are various roles for the operators in this particular network, which appear either on a dyadic level (e.g. subcontractor, principal) or net(work) level (e.g. common carrier; see Aastrup 2003, Nikkanen 2003a, Nikkanen 2003b). Through the roles the actors accept, reject or transfer the negative influences. In IFT, the role of the *common carrier* is typical for many of the actors (e.g. railcarriers, liner shipping companies, to some degree also road transportation companies), which take part in the network by providing e.g. linehaul service of transporting goods under various legs. Under this role a carrier as an operator, especially the management representing it, intuitively and implicitly aims at exposing a rather stable and predictable managerial and organisational behaviour – and respective policies (e.g. in terms of freight rates, schedules, routes). As regards price making policy, the principle of cross-subsidisation is adopted to stabilize the freight rates; as such the common carriers are determined to modify their pricing policy in a quite modest way to *gain proper neutrality*, which is required because of overreaction, e.g. in terms of new radical initiatives, tends to cause inconvience, even open disputes, of other net-

work members. Furthermore, much of the interorganisational collaboration and the exposition of how to handle the uncertainties is interpersonal, rather than purely interorganisational.

Research methods

In the empirical part of the study, the number of informants was 25, representing 15 different operators. The sample consisted of VR Cargo's major partners in Intermodal Freight Transportation in terms of total revenue of the focal firm in domestic and international intermodal business. With the help of a semi-structured questionnaire (and themes incorporated into it), a sequential, step-wise method was employed in order to maintain adequate iteration and on-going dialogue between theory and *empiria* (including a continuous interplay between acceptance and disconfirmation of proposals; see also Nikkanen 2003b).

In the pragmatic interviewing sessions the researcher allowed the respondents to skip certain questions and themes, if no adequate information was available or well-working practices evident. The researcher also aimed at modifying the range of relevant, flexible, and situation-oriented questions in every phase of the process in order to ensure the validity of the investigation. Indeed, this is often even an imperative, e.g. if the informant cannot conceptualise the ideas with his/her own vocabulary. As such there was a need for perpetual observation during the negotiation using also debriefing, if required. Occasionally the interviewer was obliged to specify the comments and narratives of the informants in order to guarantee the unanimity in the meaning of the expressions. Nevertheless, the researcher, with the help of an open dialogue, aspired to support and encourage speaking rather than compel the respondents to use certain idioms and phrases, because in this study conceptual vocabularies are addressed rather than conceptual frameworks created *a priori* (compare to Pettigrew 1998).

The researcher found it valuable that the commentators did not hesitate to reveal critical notes, if needed. Occasionally, and quite provocatively, the interviewer even demanded the respondents to use a lot of descriptive words in their narratives *('I listen as much as I ask'* as a request). However, *the question of divulgation is always problematic, if interpersonal and/or negative issues are to be discussed, revealed and analysed.*

Conflict resolution in IFT

Because of the deep and robust links and ties prevalent in the IFT network, the operators have created their own network-specific methods for handling the disturbances. A single carrier as a network member is, thus, externally constrained by the pressure caused by the other actors. Their judgment of how to handle and give meaning for the internal norms (their appropriateness) is important for the network members. Because of the bonding mechanism, adequate norms are created by common attempts and have an impact on single behavioural measures well. Business relationships provide linkages for transferring the effects – whether they are positive, negative or neutral ones.

The process for resolution is fundamental in IFT, as the progress in general is mainly based on agreement of what the direction in mutual collaboration is. Some of the participants have e.g. discussed of the use of shuttle and block train operations, and even a charter system has been under consideration with the focal firm in drayage; that is the inland haulage of containers, which is either a pre-carriage phase in exportation or a main-carriage one in importation. Though never fulfilled with any of the operators, the informal discussions and debates – chats in different groups and social nets – have led to a situation, in which the parties can test the relevance of the exposed ideas. These negotiations, which take place in different locations, allow the operators to discuss future concerns together. Moreover, this type of mutual collaboration contributes to the trust-making procedure and the coexistence by gradually increasing the trust. It was claimed by a multitude of actors that real trust (and avoidance of open conflicts*) requires acts* and episodes and hence also *reactions*.

When single persons as individual actors expose themselves to free discussions, a concrete activity is aroused. Besides, these patterns also reduce the risk of misunderstanding and uncertainty because the partners face the potential confrontations and collisions together. The process hampers and partly eliminates confusion and reduces the fear of failure. The open initiatives and informal inquiries can be regarded as positive signs, which increase the participants' willingness to approach each other.

In all, most of the participants tend to accept temporary tension but they try to avoid an open conflict. They settle the problems with joint efforts before real disputes arise. Furthermore, the expected pattern of behaviour - and the argumentation and reasoning included - is *reinforced by appropriate communication*. The communication *per se* is often a face-to-face dialogue in frequent meetings. The

rhetoric is an assurance of trustworthy behaviour. Regarding disharmony and even opportunistic behaviour, it can be claimed that there is no relationship without problems. Occasionally, however, the participants protect their rights for a certain activity by overreacting to proposals made by a partner. However, defensive actions are needed only if oppressive and adversarial acts are anticipated. This pattern of behaviour is not required if one counterpart is convinced that the other counterpart is committed to open discussions. *High tolerance for criticism* indicates that a party is conducting the activities with determination. In general, there seem to be quite a *low degree of formalism in the resolution instead of interpreting e.g. the legal bonds strictly.*

The discussion above advocates the *strength of informal collaboration within social nets*. This is a necessity because of the mutual urge for consistency. As noted, in this kind of behaviour - and an outcome of the process - the net members are looking for harmony. Argyris (1999) claims that in interpersonal relations, imbalance or incongruency are often very abhorrent. Using the ideas of cognitive balance theories, he postulates that '*cognitive balance or consistency enable the individuals to predict accurately and thus behave more effectively in their interactions with others (...)* Also, '*it is assumed that there is a basic tendency for individuals to strive to reduce imbalanced states as cognitive dissonance and inconsistency.'* (ibid., 386). Moreover, changing the roles drastically – and attaining a new position – could be even harmful. Expanding business and changing roles, as well as new positions decrease substantially the partners' opportunities in their attempts to give new kinds of solutions for the others.

With respect to *influence of power* in conflict resolution, the dominant carrier can, e.g. in one specific relationship, try to stipulate the norms unilaterally. A too determined and proactive course of action in a dyadic relationship, in which the company either strongly and unilaterally or modestly influences the decisions made in the relationship, can later be a source of conflict. Moreover, the other network member is recurrently, more or less, obliged to adopt certain type of activities or practices in order to ensure the continuity of the relationship, thus indicating compliance. Inevitably, in the long run, there are lots of benefits and rewards for the other party as well, making this kind of relationship appealing and raising the attraction. Furthermore, it is also assumed that the counterpart considers the propositions and initiatives as they are; these suggestions are later converted to new activities. Hence, the relationship once created is often *asymmetri*c not just in terms of bargaining power but also in terms of control, pace in developing business relationship, or governance, bringing unilaterally better outcomes for a single party.

Scope of behavioural responses

In IFT business, the activities of conflict resolution are strongly incorporated into the roles of the companies. In the intermodal network with stable structural elements, the roles are based on a settled division of tasks and changing the role is always subject to minor changes in structures. Moreover, the role means that a single carrier is willing to express its commitment to behave as presumed under a specific role. Actor bonds, and more specifically, the bonding in general, favours the use of conventional roles. *As such the roles of the operators delimit the scope of behavioural responses.* As regards the interplay between the two concepts – role and position – it is assumed that they are actually different facets of the same phenomenon (Halinen 1994). Hence, in this study a bipolar interpretation of the role/position concept is employed (see Fig.2; compare to Anderson *et al.* 1998)

Consequently, with the help of bonded structures and because of the constraints set up by the members of the network, the role of the common carrier is performed in a rather limited scope. *Common carrier is a major role for a focal firm in the net(work)context*. The following illustration describes the amplitude of the expected patterns of behaviour.

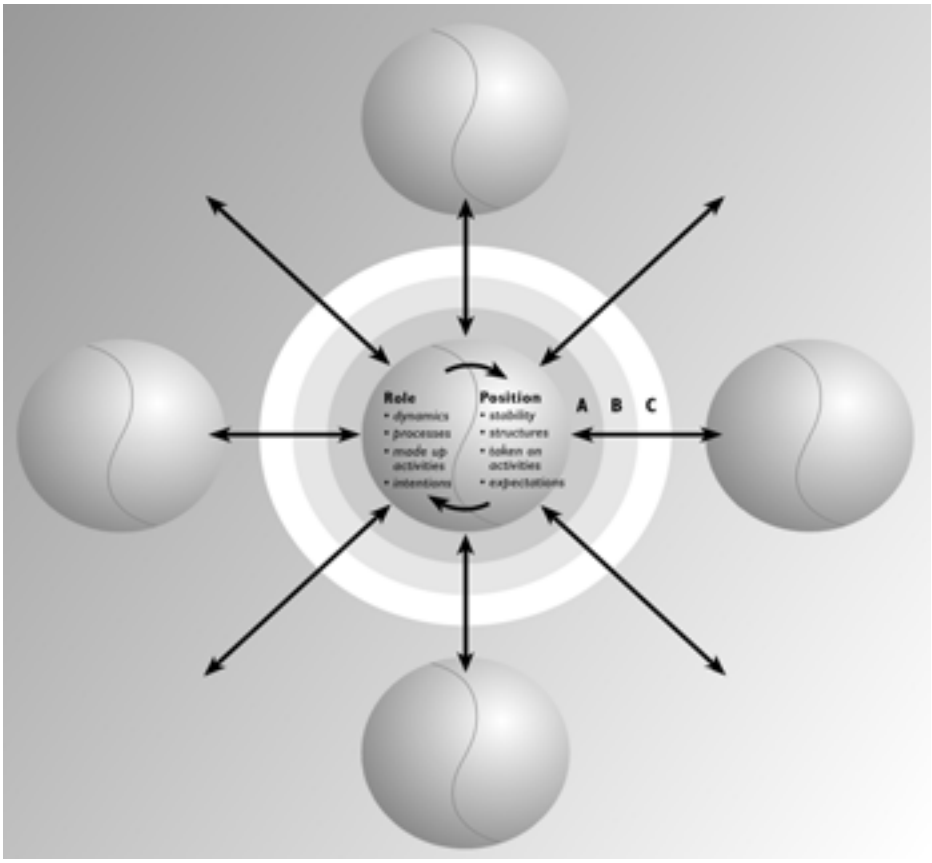

Figure 2. Amplitude of Expected Patterns of Behaviour for a Common Carrier

In the illustration the following areas are represented. Area A describes the area *expected* by the counterparts, because the role embraced by the focal firm is consistent with this kind of behaviour. Moreover, it is *accepted* as well, since it does not disturb the internal harmony and the settled tasks in the network. In general, the counterparts are willing to perceive this type of behaviour in a positive manner, since it is interpreted to be in accordance with the chosen course of action. Area B is not expected, but it is accepted by the other operators in contrast to area C, which is neither expected nor accepted by the other operators. Thus, the focal firm is not willing to carry a risk of radically expanding to new business areas, which are not presentations of its own core competency and primary activities.

Extending the explanation with co-concepts

Finally, a suggestion is offered to describe the two opposite forces of the engagement. It is now claimed that engagement can be a combination of involvement in a general manner and the adherence influenced strongly by how the actor is embedded in the network. As such, how a single actor is engaged in a net(work) is influenced by the pertinent threat of non-desirable, even deleterious effects as well. Due to the settled division of tasks and responsibilities, and because in the IFT network the exit boundaries are high, the actors are obliged to confront the harmful effects rather than ignore or reject them. This means that spreading the harmful effects with the help of transmission is not often possible.

Generally speaking, the involvement in the network takes place through *interlocked nets;* an outstanding notion is that a single (often human) actor can define the nets precisely, whether they be focal, social, or geographical in terms of setting boundaries. However, the intermodal network in its true extent is beyond these definitions, as many of the influential actors are not well-known or even identified for the members of the focal net. The involvement is required because the actors are affixed to a network, but also to ensure development.

The second component of engagement can be depicted with *adherence*: it is an *unconscious protection against anticipated harmful or deleterious effects of the network* involvement; this protection is needed because of the fact that various episodes and activities - even single acts - cause stress for the relationship (and for the roles as well): e.g. reduced independency and increased dependency, coercive adaptations, less control over own resources, continuous and unsettled interorganisational tension and stress, even hidden aggression can be a source for an open conflict. These features might hamper the actors' deep and true presence in the network. Bonds as components of trust, and especially the social ones *reduce the tension* and allow handling own business regardless of the longer distance (e.g. inconvience) for the other actors. In figure 3 these two different dimensions of the engagement are depicted.

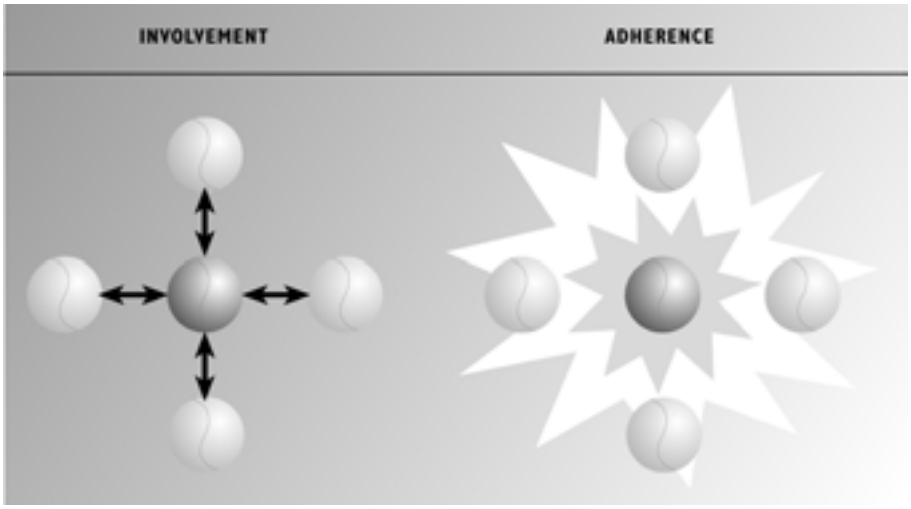

Figure 3. Two Underlying Forces Influencing the Engagement

Each actor is obliged to cope with these two underlying forces causing casual instability for the relationship. Despite of this, changes in the roles of IM operators are often minor. Moreover, the line of action for settling disputes and conflicts is intended particularly for handling the negative effects of the network engagement.

Because embeddedness refers mainly to social structures in a chosen network, it has a direct link to roles. As discussed above, the question of whether the roles as outcomes are mainly due to the structures, or the processes, or, as might be typical, both of these, is not clear. Moreover, it is unclear how the effects of the networks in a narrow scope and the network society in a broader scope are transferred to the (business) behaviour with the help of the relationships. The modified and redesigned reality can cause modified behaviour because of the new perceptions and interpretations of the network. Later these new ideas are converted to new type of relationships through the social relationships. Acceptance for the behaviour takes place through the roles and through experimentation. However, the context limits the generalisability of the results: events occur under specific circumstances in some space and at some point of time.

Conclusions

In tightly bonded networks, as in the case of Intermodal Freight Transportation (IFT), stable roles (capturing the processual character of the networtk engagement) and position (referring mainly to network structures) give a basis for understanding the various internal methods to avoid the negative influences of network involvement. Conflict as an expression of interorganisational disagreement, inconvience or friction, even implying open clashes, is a typical feature, as every relationship includes positive and negative features (e.g. concord vs. discord and dialectical processes). The focal company of this study (VR Cargo as a railcarrier) and its various roles appearing either on dyadic level or net(work) level (e.g. role of common carrier including the idea of neutrality) limit the scope of activities also when conflict resolution takes place. Communication, whether formal or informal, gives opportunities for the parties to stabilize and release the interorganisational stress.

In a tightly bonded network a single actor is obliged to face all the effects of the network presence, whether positive or negative, because the exit barriers are high, and, as in the IFT network, also undesirable. Robust relations require sophisticated methods to reduce the threat of failures as well. In this sense, the mechanisms for handling the difficulties and the procedure for conflict resolution are of major importance for the on-going collaboration among network operators. One of the major expectations for the conformity of behaviour is the anticipated means for working together also under problematic circumstances. The participants try to avoid conflict by searching for a resolution, which is often done rationally and intentionally but also intuitively and subconsciously. This is an obligation, since expressions of strong arrogance increase tension, and could lead to an open conflict and discord especially if – and when – power is unequally distributed.

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Essay 7

From Interaction-based Approach to Dialectical Confrontation: Some Theoretical Proposals for Understanding the Consistency of Dissentient Interorganisational Relationships

Abstract

The main objective of this conceptual study is to describe an idea of dialectical approach for understanding the conformities of interorganisational behaviour, by employing a way of thinking in which adversarial, dissensual and consensual features in interorganisational relationships and subsequent processes are sharply contrasted. It is proposed that a network as a set of diverse relationships can be characterised by dialectical means, exposing the opposite-driving dimensions. In the research work three approaches to discuss relationships (managerial, network-based and dialectical) are presented and compared. It is assumed that dialectical approach (despite of its dualistic nature and polarising concepts) can extend the analytical scope by introducing new conceptual vocabulary and by grasping displeasing issues, which are often neglected in relationship studies. From the empirical point of view, this requires sensitive methods to face the subconscious elements of the relationships, which are influenced by interpersonal contacts. To avoid analytical narrow-mindness, besides discussing the positive sides of a relationship (e.g. trust and commitment, open communication and mutual respect in focus), the researcher should not only consider the problems of one particular relationship (lack of communication, competition and dispersed interests) but also pay proper attention to the extreme features as well

(e.g. destruction and annihilation, anger and hate, urge to revenge), which affect the way the actors truly perceive the relationships.

Introduction

Firms and organisations as actors create and maintain (business) relationships e.g. in order to improve the conditions for higher performance. Accordingly, with network engagement the actors predominantly look for positive features; there is an emphasis on benevolent, co-operative behaviour, which means that the actors aim at mutual, rewarding goals addressing an intentional and voluntaristic view of human nature (Tikkanen 1997, p. 595). However, in a network, a single actor is faced with several harmful and negative effects as well. As regards burdens and threats, e.g. loss of control (unruliness), resource commitment, undetermindness (misdirected actions), exclusiveness and stickiness (the firm becomes connected with a whole network of other firms through a particular relationship) are some of the most typical ones; even deleterious effects can be revealed (Holmlund 1997, p.135; Håkanson and Snehota 1997, p.17-22; Andersson et al. 1994, p. 6-11). On the other hand, synergetic performance, which is vital for the actors when they assess the rewards, can not be achieved continuously without considering the drawbacks and discontinuity as well.

From the analytical point of view, in relationship studies there seem to be a trend to address mainly the positive side of interaction in terms of discussing e.g. trust and commitment, open communication or mutual rewards. Hence, the impact of the 'other side' (revealing the real scope and intensity of deleterious forces) for relationship development is often underestimated.

Objectives and Scope

The main objective of this conceptual study is to describe the idea of a dialectical approach for understanding the conformities of interorganisational behaviour by sharply contrasting adversarial, dissensual and consensual features in interorganisational relationships and subsequent processes. It is proposed that a network as a set of diverse relationships can be characterised by dialectical means, exposing the opposite-driving and contrarious forces, which are actually expressions of vitality and continuity for the consistency of the relationship, though primarily they seem to disconnect a particular link leading gradually to to-

tal dissolution. It is thus assumed that a sturdy analysis of one particular phenomenon (e.g. the creation of mutual trust in a relationship between actors) requires tenacious measures for analysing the utmost opposite side of that phenomenon as well. There seems to be a dualistic and invisible balance between the extremes, despite of the obvious incongruency. The revealed contradictions are inseparable. With the help of an aggravated and sharp juxtaposition implying dualism, the researcher can gain new insights for understanding the overall nature of the relationship as well – its positive or negative dimensions, leading first to dynamical disequilibrium, and later triggering new efforts for changing the current status quo.

As often noted (see e.g. Berger and Luckmann 1966), reality is a social construction, which means that every actor (whether a firm, a group of people, or a single human actor) has a limited ability to comprehend the reality especially when the latent features of the relationships – which can be hostile, and devastating expressing strong arrogance, or even annihilating - are under consideration. Despite the apparent trust manifested openly between two collaborators, there is always a seed of mistrust, suspicious behaviour, and even unilateral hate as well. Because interorganisational issues are often more inter*personal* than purely interorganisational by nature, normative discussion on the content of well-working relationships and their formal character of neutrality (even reciprocal harmony) conceals the strong influence of personal attitudes and their hidden subversive nature.

Dialectics in General

Despite of the fact that dialectics can be a rather neutral word and/or practice (originally referring to discourse, discussion even debate), the dialectic procedure addresses contradictions, conflicts and strong disharmony instead of benevolence and harmony in relationships. Particularly when examined mainly as a social phenomenon, dialectics can be summarised as follows (modified slightly from Arbnor and Bjerke 1997, p. 162):

Unity and struggle of contradictions. Contradictions condition each other and bring meaningfulness to the poles; this requires effective use of polarizing concepts.

Transition of quantitative accumulation into a new quality. By using some strong metaphors as a starting point, Arbnor and Bjerke refer to quick changes into completely new qualitative configurations.

Everything undergoes development and becomes its own contradiction. To generalise this it can be assumed e.g. that trust becomes intrinsically hate, the development in the relationship is incrementally changed into destruction (and so on). Subsequently, the conceived negation is later a basis for a next stage in relationship development.

Arbnor and Bjerke (1997) use this three-wise procedure to explain the links between the features in the above-mentioned explanation: the theoretical start requires first a struggle of contradictions, which leads – with the help of accumulation of everyday language – to a new quality (descriptive and ideal-type languages as a result), which will negate what was originally given. Finally, the development leads to its own contradiction.

Some philosophers have already increased the knowledge and power of juxtapositions: Socrates and his method of deep cross-examination or Plato's dialectic aim at achieving the highest knowledge are some of the first attempts to use the idea. Also Engels' theory of dialectic materialism and dialectic model of history is a well-known example of how to express of the logic of the dialectical processes in general: Fichte was the first to present the triad which was lately supported by Hegel. Indeed, according to Hegel there is a triadic interplay between thesis, antithesis and synthesis or as he puts it: *'the evolution of ideas occurs through a dialectical process - that is, a concept gives rise to its opposite, and as a result of this conflict, a third view, the synthesis, arises. The synthesis is at a higher level of truth than the first two views.'*

Furthermore, dialectics can be a method of reasoning that aims at understanding e.g. change and interconnections with their opposite and contradictory sides. The dualistic worldview is recognized also in the teological thinking (see e.g. Enckell 2000 for a subjective synthesis and comparison): e.g. the gnostical interpretation of the transcendental world strongly addresses the dualism and sharp difference between the 'Go(o)d' and 'bad'.

Positioning the Dialectical Approach in Studying Interorganisational Relationships

The illustration below (Fig. 1) depicts different approaches for studying interorganisational behaviour and subsequent relationships in a particular network, exposing also the idea of dialectical confrontation as a starting point in analysis; it

is also assumed that organizational behaviour is influenced by the role and position of an actor in a network.

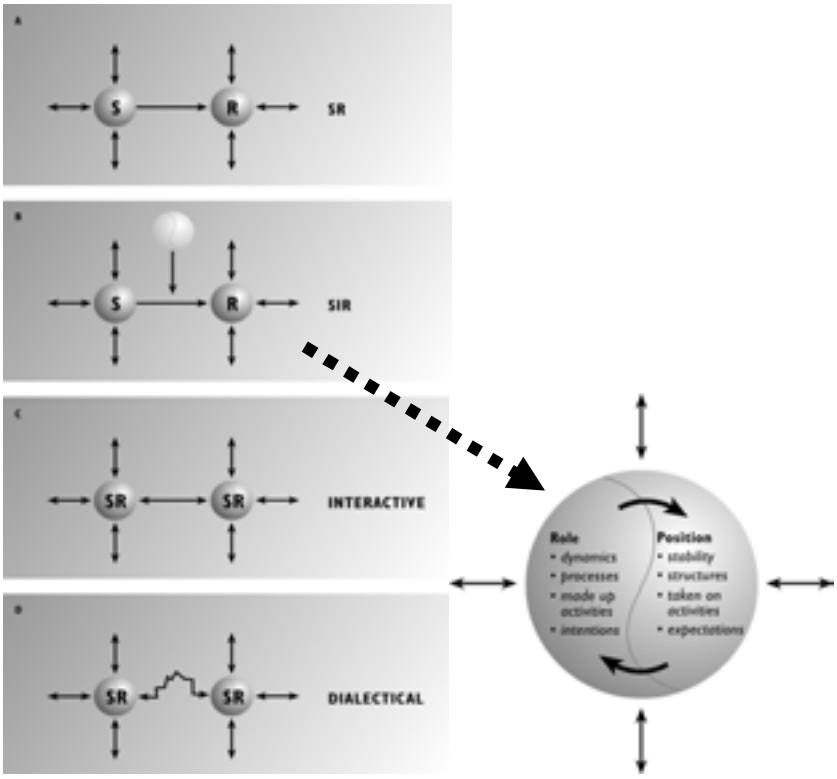

Figure 1. Different Approaches for Analysing Interorganisational Relationships with the Help of a Bi-faceted Interpretation of the Role-Position Concept

Key: S = stimulus type of action, R = response type of reaction, I = intervention (by third party in triadic nets in setting B)

Besides conventional, managerial stimulus-response type of explanations offering one ontological basis for deeper discussion (indicating proactive and reactive measures with (B) or without intervention (A)), the interaction-based approach (C) aims at combining several contradictional aspects in relationships, such as co-operation, competition and conflict, which can be present simultaneously.

However, the theory is based on the idea of benevolent and mutually rewarding collaboration. Hence, not just in well-established business jargon but also in scientific analysis the rhetoric is often obtrusively positive, approaching the other side faintly (e.g. lack of trust, not aggression, is the opposite for trust, lack of commitment, not extermination, is the opposite for commitment). Fierce contradiction – such as willingness for destruction – is not employed by researchers in their analysis or their conceptualisations. The major focus in pragmatical analysis is too often too narrow because the positive effects of the network engagement are so highly emphasised. Thus there seem to be a need to enhance the scope of the widely-used concepts for new areas.

As regards the dialectical explanation (D), the role and position of a single actor in a network are essential in understanding the attributes of the conflicts. Most networks are unstable e.g. in terms of power, which means that one leading player's arrogant dominance over the others might force the others for coercive adaptations, which are perceived in a deprecating or antagonistic way. The follower- type of actor (in terms of organizational responses; setting A in Fig. 1) perceives these situations negatively, and if no appropriate conflict resolution methods are evident, this will lead to an open or hidden clash later.

In the dialectical approach it is assumed that exposition of strong contradiction can be valid in the analysis, when the true content of relationships is viewed; the concept of trust cannot exist without considering hate and there can be no portrayal for concept development without considering the forces of annihilation or destruction as well. In other words, a concept which is created to describe a certain phenomenon (e.g. trust) should include its own contradiction; somehow the concept that is encapsulated by a specific wording, actually should give space to explain the opposite negation as well.

It is thus postulated that every phenomenon that is studied conceptually, should embrace its contradictions explicitly as well; without true understanding of the other side, the subject that is primarily under consideration can not be understood either. Thus strong duality can be seen as a means for discussing dialectic relations. Analytically, it is not possible to understand the true nature of a relationship without considering the '*dark side'*, though this attempt requires highly sensitive methods in the empirical analysis. The major stimulus for dynamics in relationships is often included in the strong tension and dualistic balance that appears openly or is hidden in many forms and is prevalent in every network relationship.

Development of Juxtapositions in Relationships

Figure 2 explains the development of a particular relationship through time, expressing also how strongly these relationships incrementally embrace the tensions and how this finally causes extreme manifestations (original presentation by Ford et al. 1998 as a basis). Particularly at the stable stage, both harmony (and concord) and conflicts (discord) are present.

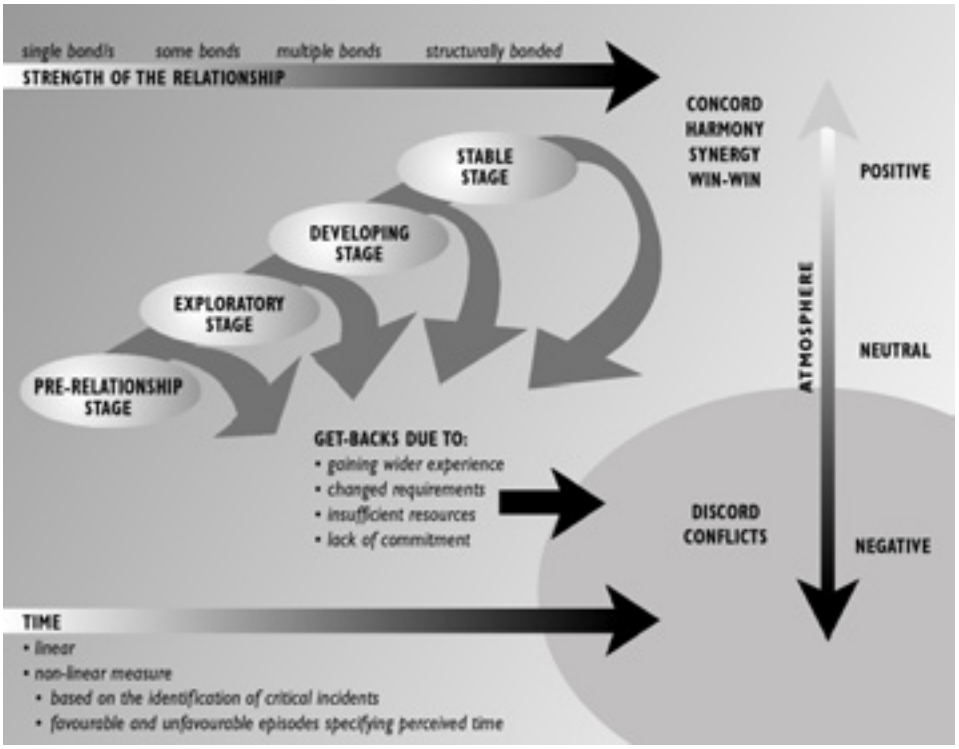

Figure 2. The Development of Tensions and Juxtapositions in Longer Relationships in Structurally Bonded Net(work)s

The depth of the relationship and its character can not be understood without considering the extremely negative dimensions of the relationship as well. In tightly bonded networks the actors are often obliged to cooperate – at least on some minor matters – though it is often very difficult to accept or tolerate the other one.

It can be postulated that in structurally bonded networks in which the actors are interdependent (one actor's decisions influence the other ones), the probability of clashes increases with time. Numerous scholars seem to stress the prevalence of positive win-win- situations in stronger relationships (ignoring the importance of clashes or underestimating their frequency). However, Castells (1996, p. 472) is quite sceptical when discussing this idea: in his view '*the losers pay for the winners*'. This implies that a zero-sum game (dominant player as a winner) is resulted under many circumstances in the networked society. Undoubtedly, this can cause hostile responses and corresponding behaviour among the actors.

The actors are obliged to deal with the dialectical processes *on various organizational levels*: the dynamics in one particular net(work) stem not only from the general, interorganisational tensions among the members of the network but appears also on dyadic (e.g. focal firm *vis-à-vis* counterpart), triadic (hostile and/or friendly intervention/s from a third party's side) or net (referring to a limited set of actors and relationships, respectively, of an entire network) level. This is evident as the interorganisational issues are often as much inter*personal* (communication takes place in social nets rather than in the entire network) than purely interorganisational. For Arbnor and Bjerke (1997, p. 59), describing dialectic relations under the actors' approach refers to the logic of ambiguity: relations change qualitatively in a continuous transformation. It is, thus, a necessity to make the transcendental interaction visible. However, here ambiguity does not refer to some blurred indistinctness but rather for a dualistic interpretation.

Despite of the recuperative processes prevalent in every relationship, basically all institutions (and actors generating and maintaining relationships) are inherently subject to deterioration. The attitudes towards inconvient social systems can be explained with three basic strategies: loyalty, voice and exit (Hirschmann 1970). Acting loyally means that an actor is complying silently or cooperating without complaining (and probably the relationship hides the deep confrontations). Voice can be defined as an expression of anger with an intention to solve an actual problem (uncovering strongly extreme experiences and their impact). In very difficult dysfunctional systems, exit is often the only solution for an actor, though e.g. in deeply and structurally bonded nets with diverse tying elements, exit is neither possible nor desirable (compare to the strength of the relationship

and its strong adherence in Fig. 2, making the total leave impracticable for a single actor).

Proposal for Extending the Analytical Scope through the Dialectical Approach

In figure 3, three different approaches are presented in order to distinguish the scope of different views in analysing interorganisational relationships (compare to Fig. 1 in which A and B are typically managerial approaches employing the SR-scheme, C as an interactive representation refers to the network-based approach and D is the dialectical approach).

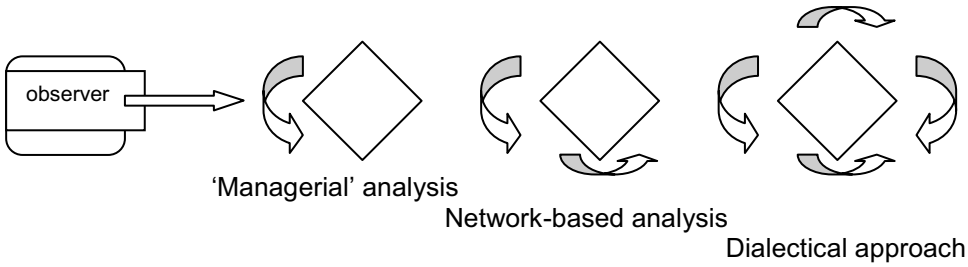

Figure 3: Analytical Scope of Three Approaches in Studying the Dimensions of Interorganisational Relationships

The managerial approach/analysis refers here to studies which aim at creating strategic models for higher performance and management of resources among business actors. The studies are characterised by a mechanistic Stimulus Response (SR)- scheme attached by an urge to trace practical strategic benefits (oversimplification and appropriate rhetoric thus required). The network-based approach provides the analysis with new mindsets (existence of simultaneous collaboration and competition). It is proposed that the dialectical approach (despite its dualistic nature and polarising concepts) can extend the analytical scope by introducing new conceptual vocabulary and by grasping displeasing issues, which are often neglected in relationship. The 'other side' contains the negations implying subsequent conceptualisation, which should be carefully considered in network analysis. Some of the extreme responses - such as willingness for revenge – often take place often on inter*personal* level. Due to unilat-

eral success, some other actors perceive this negatively, which can lead to extreme activities.

One of the probable paths for increasing the intensity of studies could be in the idea of deconstruction, which means that language *per se* (and its awkward nature) is not an appropriate medium to reveal the truth directly. There seems to be tendency for scholars to create binary conceptual systems (in contrast to managerial approaches uncovering and exploiting an idea of simple distinction between one basic concept and its naïve contradiction), in which one term is constituted as the privileged norm later creating hierarchies of meaning (Jary and Jary 1999). This might lead to socially institutionalised rhetoric (which is even an urge for managerially-oriented scholars). Deconstruction aims at revealing the ambivalence and incongruousness of texts, which can only be understood in relation to other ones; as Cova (1994, p. 280) puts it (when claiming that reality is actually a pure illusion): '*everything is intertextual, not causal, or predictive*'. A researcher, however, should be committed to uncovering critically the simplicity and inappropriateness of managerial rhetoric, and the logical analysis that hides as much as its reveals.

Concluding Discussion and Suggestions for Further Studies

Generally speaking, it is suggested that proper attention should be paid to discussing the 'dark side' of relationships, aiming at uncovering the real motivations for certain types of behaviour, processes to cope with conflicts and their outcome. As regards further studies, it should be analysed what the adequate means and methods for conflict resolution in the interorganisational context are especially if (and when) polarised concepts are truly tested and employed; definitely, this requires sensitive analytical methods for grasping the subconscious mind of the actors, implying e.g. manifestation of anger in relationships. Pragmatically, continuous evaluations of trust-mistrust-hate- type of juxtapositions are needed with enough attention for synthesising processes. In structurally bonded net(work)s the actors are obliged to seek for some balance in interaction, though there seems to be a tendency for disequilibrium in every relationship; the dynamics in networks actually stem from this state. Narratives, stories and answers to simple questions (in the empirical research procedure) often hide the dark mind and willingness for e.g. destruction and revenge. It thus a necessity (e.g. when conducting interviews) that the researcher should always

have the ability and willingness to reflect deeply and critically the responses and analyse and interpret them correctly *a posteriori*.

The WUAWUG syndrome (What-you/U-ask-is-what-you/U-get) can be one of the obstacles for the researcher to get in-depth knowledge regarding the annoying and antagonistic – even belligerent - issues that should be considered not only on interpersonal but on interorganisational level as well. A pre-defined theoretical framework created prior to empirical analysis and containing simple, overoptimistic and smooth rhetoric might force the researcher to use limited wording, concepts and conceptual vocabulary; Gummeson (1991) discusses a *procrustean science* - an idea derived from ancient Greek mythology - which refers to misuses of theories and models for formulating the hypotheses to be tested. When such hypotheses are used as the point of departure in research '*they govern the way questions are asked and the way answers and other observations are interpreted'* (Gummeson 1991, p. 55). To avoid analytical narrowmindness, besides discussing the positive sides of a relationship (attributes of trust and commitment, open communication, mutual respect), the researcher should not only consider the problems of one particular relationship (lack of communication, competition and dispersed interests) but also the extreme features (e.g. destruction and annihilation, anger and hate, urge to revenge). In this attempt the dialectical approach (complementing managerial and network-based approaches) can be valuable, as this particular view strongly addresses the meaning of negations and juxtapositions in relationships.

Finally, it can be suggested that dialectical contradictions probably can not be totally solved; especially in structurally bonded networks there always exists disharmony, which should be accepted by the actors maintaining relationships and observer conducting research work. The dialectical approach can give new mindsets for in-depth analysis. It is worth questioning, whether consideration of the dialectic approach (and negations) is even a *sine qua non* in analysing properly the true content of (business) relationships.

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Essay 8

Spatial Concerns in Logistical Networks with Special Reference to Proximity

Abstract

In this mainly conceptual study, some aspects of space in logistical networks are discussed; especially distance as a reflection of spatiality is scrutinised. The theoretical contemplation is complemented with preliminary empirical analysis in transportation industry and networks. Because networks as metaphorical conceptualisations have very strong geographical aspects, it is necessary to link the question of spatiality - e.g. interorganisational proximity - to network analysis. Spatio-temporal aspects constitute even some ontological features in network analysis as they give valuable conceptualised tools for comprehending the diversity and complexity of networks. The significance of embeddedness in network studies means also that the spatiality should be deliberated, as embeddedness can also be interpreted as involvement in local or close dyadic and network relationships. Distance equals to interorganisational friction as presumed in literature, though often implicitly expressed (e.g. impedance, inconvience) and it can be an expression for studying the proximity between the actors. Conventionally, the Newtonian-based interpretation of interaction has dominated the logistical analysis with strong focus on gravitation, aggregate type of modelling and analysis of adequate distance measures (time and cost distance). With the help of extensions for assessing and measuring interorganisational interaction and its frequency, new types of correlations and interpretations can be formulated to describe the proximity and closeness-remoteness- axis between the participants of logistical networks.

Introduction

Space or *spatiality* have been suggested to be among the most remarkable - even ontological - dimensions in network studies, although not enough attention has been paid to them (Törnroos et al. 1995; Oinas 1998; Halinen and Törnroos 1998). Theoretically, it is very difficult - if not even impossible - to discuss network-related issues without spatial considerations, especially when infrastructural networks are scrutinised. As Frybourg and Nijkamp (1998, p.16) point out '*network has a geographic meaning and covers a given area*'. Furthermore, this implies that there is '*no network without territory and no territory without network'*. It is thus necessary to pay proper attention to the closeness-remoteness aspects in networks, reflecting the different views of analysing organisational proximity.

When analysing how a single actor is embedded in its surroundings, the question of *s*patial embeddedness should be viewed as well (Halinen and Törnroos 1998; Oinas 1998). Spatial embeddedness can refer to the role of space and geography in networks in a general manner without an explicit content. Generally speaking, there are actually two different perspectives for discussing particularly this element: spatial issues as an outcome of related theory-making and testing (e.g. using the location theory as a presumption) and spatio-mental perspective, which encapsulates human actors' different understanding of space with the help of personal mental maps (Halinen and Törnroos 1998).

The role of space and geographical dimensions in general is inherently associated with logistical thinking, though *per se* not a major item of interest in related studies. In this study logistics as a concept refers to the operational side of supply chain management, such as transportation systems, which constitute network-like structures. In infrastructural logistics networks (with diverse hubs, nodes and connecting links), spatiality is often understood, but implicitly expressed in the models; some researchers even claim that space is nearly ignored in advanced research work (Törnroos et al. 1995). In order to grasp the spatial issues more accurately, the following illustration depicts the interconnected elements of the logistics theory (Törnroos et al. 1995):

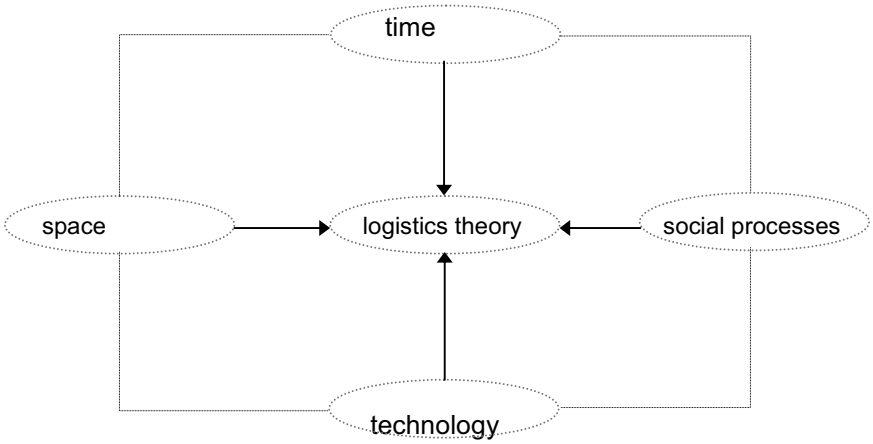

Figure 1. Core Concepts of Logistics Theory for Analysing Networks

Besides the ontological concepts space and time, also *social processes* have an influence on how actors observe the outer reality and thus perceive proximity. When operationalising the space element, three items can be particularly derived: location, spatial interaction and the distance factor in the interfirm context, and the firm-environment interface (Törnroos et al.1995). With respect to the infrastructural networks, it is a necessity to make the present system work more efficiently in space, changing the space through new infrastructural investments to serve the needs of logistics better, and co-operating with other firms to manage and organise the geography of logistics more efficiently (Törnroos *et al*. 1995, 21). As regards technology, state-of-the-art solutions in sending and dealing with information flows (e.g. for tracing and tracking single consignments) can compress the in-transit time in supply chains, shrinking the scope of networks and creating more compact visions of their extent for the observing actors.

Castells (1996, p.376) hypothesises that actually space organises time in a network society; this statement assumes the domination of space by time. Castells is obviously interested in the social meaning of time, analysed with adequate social theories rather than geographical and/or logistical models. For Castells (1996, p.410) space is the expression, not a reflection of a networked society, as spatial forms and processes are formed by the dynamics of the overall social structure or social processes. Furthermore, '*space is crystallised time'* (ibid. 411).

Scope and objectives

The major objective of this study is to discuss and analyse different perspectives of spatial issues particularly in logistical networks; especially distance as a reflection of proximity is scrutinised. The analysis relies on the use of related theories, beginning from conventional interaction models, and subsequently enhancing the scope from the traditional approach to other types of distance measure (mental maps often as an outcome). Some preliminary empirical testing is also provided (intermodal freight transportation networks with the Finnish railway system as a testing ground). In this study the distance measure covers not only physical proximity, but also organisational proximity based on the actors' perceptions of obstacles and friction. The actors - alone or collegially - perceive and interpret the common space in a different manner based on their own mental maps; interorganisational friction can thus be an expression of perceived distance.

When analysing connectedness in infrastructural networks it is important to evaluate the interaction between the nodes broadly and deeply (e.g. perceiving actors or hubs, as often in transportation nets) by utilising appropriate interaction models. Unlike in logistics, spatio-temporal dimensions are widely contemplated e.g. in the modern geography of enterprises (see e.g. Oinas 1998). Furthermore, the growing significance of embeddedness *inter alia* as a conceptualisation in network studies means also that the spatiality should considered; embeddedness can be interpreted as the involvement of the actors in local or close dyadic and network relationships.

Conventional Approach for Distance in Explaining Spatial Interaction

As mentioned above, distance can be defined as friction - impedance indicating spatial separation or segregation - between two points. This friction is an obstacle or hinder for interaction in space, thus reducing the amount and frequency of desired interaction. The major interest for considering geographical aspects in conventional logistics research is to find a correlation between interaction and distance by using adequate variables. The correlation between distance and interaction can be depicted graphically with a distance-decay curve: a downward loping curve expresses a simple trade-off, in which spatial interaction tends to diminish with distance. Distance per se is an expression and a measurement

tool for studying the proximity between the actors in logistical networks. Conventionally, the Newtonian-based interpretation of interaction has dominated the analysis with strong focus on 'gravitation', aggregate type of modelling and adequate distance measures. Thus two distinct levels can be distinguished: either individuals as actors (disaggregate level) or groups of people (aggregate level) are under consideration. Distance is typically measured with concrete distance (close to Euclidean distance), which means a straight connecting line between two points or a physical distance between two points. In addition, concepts like time distance and cost distance can be relevant. These models are still more predictive than explanatory - actually these models do not tell much about the motives and reasons beyond the interaction. Particularly aggregate correlations predominantly express statistical probabilities and random distributions for behaviour. Due to the limitations typical for traditional analysis, there is lot of interest to wider the discussion with new initiatives.

Besides physical distance (between nodes such like terminals in intermodal transportation), particularly in logistical networks with diverse hubs and nodes, cost distance and time distance can be even more relevant than physical distance, especially when a shipper assess the closeness or remoteness. Cost distance is the sum of the total costs (often evaluated with the help of the total cost of ownership- approach) during the transportation legs; the time distance denotes the total travelling time between two points. Regarding the time distance, it is often an urge for the operators in supply chains to reduce the transportation time by eliminating the non-value added time (NVAT). It has been estimated that the NVAT can be as high as 95 % of the total time (as interpreted by Burgess 1998, p.18).

When the total spatial interaction in logistical network studies is assessed, gravity models are the most frequently applied. These models are analogies to the common Newtonian theory of interaction, which aims at finding correlation between interaction, mass components (implying attraction) and distance. The analysis is typical on the aggregate level with strong descriptive expression. Some attempts have been made to increase the explanation power of these models, but they are still more predictive than explanatory - actually these models do not tell much about the motives and reasons beyond the interaction (Marjanen 1997). One of the obstacles in the aggregate correlations is that they express predominantly statistical probabilities and random distributions for behaviour.

As regards interaction, scholars mostly define total interaction as the flow between two points that are scrutinised - between i and j (e.g. Fotheringham and

O'Kelly 1989). In the gravity models the distance measure should be quantifiable - that is measurable in some unitary, mainly physical units such like geographical units (see Appendix 1 for details). For this reason the use of more cognitive, attitudinal, and social distance measures are often criticized, because they are based on qualitative evaluations among actors - they are ordinal in nature (Sen and Smith 1995); moreover the classical gravity type of expression as a functional relation '*cannot possibly hold for all ordinal transformations of such distances,* (e.g. social distance) *between population centres i and* j, (which can be in more general relation more context-specified, and flexible: in general the mass component) *this model would fail to have any empirical content whatsoever*' (op.cit.,p. 20; the comments in parenthesis by the present author).

Despite of the dominance of the traditional approach, also in logistics research scholars have recently paid more attention to disaggregate cognitive spatial choices with detailed description of the decision-making of individuals. Hence, distance equals to interorganisational friction, as presumed in network-oriented literature, though often implicitly expressed (e.g. impedance, inconvience, lack of intimacy). Williamson claims (1986, p.176) that basically even transaction costs *'are the economic equivalent of friction in a physical system'.* Accordingly, friction is parallel to impedance, which means that the term is close to the distance attribute. The Transaction Cost Approach (TCA) contributes to the theoretical discussion on spatial issues as well, as this particular theory attributes to determining the optimal type of relationship a firm should develop in the network; at the extreme, a (business) relationship is either a close one (as in smaller nets) or distant (as often in the entire network).

Enhancing the Content of Distance

In contrast to geographical distance, which locates facilities and assesses the amount of interaction, cognitive distance can be classified as *subjective distance.* In this sense Piaget's developmental theory (Piaget's fundamentals: perception and conception of single items like space, or physical causality among individuals) can be integrated to spatial analysis. Every individual goes through different stages in his/her life - from infancy to adulthood - creating mental or cognitive maps from the surrounding reality. Information is filtered and it is a subjective perception of reality and real-life circumstances. Thus, an individual continuously assesses the alternatives, and with the help of cumulating knowledge, re-locates points in his/her mind, and consequently evaluates the distance e.g. with the help of mental maps (e.g. Novak 2002, p. 58-63 discusses the ba-

sic elements of Piaget's theory). In the constructive paradigm of behavioural sciences each individual creates new solutions and knowledge to a solid basis, which is (re)constructed over time. The cognitive distance is a result of personal experiences with attitudes, values, norms, and preferences as critical forces and drivers. In the spatial theory of interaction the distance hypothesis is common: the location of more attractive centres tends to be underestimated in terms of distance. Individuals may have adopted new models when visiting this relatively more attractive place or they have gathered more information of the place through media or personal contacts.

In the network-based approach, where networks are defined as sets of relationships, four types of distance variables are generally listed: besides geographical and time distance, social and technological distances are considered (Ford 1997, p. 44). The geographical distance has undeniably a powerful cultural connotation, and thus dispersed interpretations are typical for the term. Table 1 is compilation of various ways to discuss the different dimensions and their measurement criteria (compiled from presentations by Turnbull and Topcu 1994, p.20; Ford 1997; Castells 1996; Ford et al. 1998). Some preliminary findings of distance measure in intermodal freight transportation industry, which represents transportation systems as logistical networks, have been added as well (see also Nikkanen 2003, 98-105).

Table 1. Variations of Distance Measure in Interorganisational Studies

Dimension	*Criteria for Measuring the Attribute*
• social distance	level of friendship extent of exchange of special information frequency of contacts level of knowledge about each other
• cultural distance	cultural differences with a non-local partner
• geographical distance	location of point of interest (hubs and nodes)
• technological distance	differences in technologies differences in production technologies and features number/event of technical adaptation required
• time distance	lead time (between acts, or actions, or episodes)

The interorganisational distance varies between zero (high, intense interaction, no preventing factors, high frequency) and infinite (no connections, no transactions, no interaction; Castells 1996). If the preventing factors totally block interaction, the perceived distance between the partners is infinite. In network studies it can be hypothesised that objective distance might be a poor predictor of interorganisational performance, since the social nets compress the distance by shrinking the space. In all, effective communication does not necessarily require geographical proximity, because the use of communication applications enables close contacts also in distant locations. Consequently, distance as a concept can be interpreted as accessibility or interorganisational location, thus having tangents with the position concept. Moreover, the technological distance measure is essential for assessing the degree of structural bonding. It is hypothesised that stronger adaptation of advance technology (e.g. EDI or similar information delivery systems) significantly reduces this distance measure. Distance as a hinder in interaction is specially an important attribute in the so called co-existence phase of network formation; this stage is one of the stages in the relationship evolution, leading subsequently to deeper co-operation among the actors in the net (Easton and Araujo 1992, p.71-81).

In general, the adoption of new behavioural features seems to have an impact on the perception of distance. Adoption is a process among individuals, having such aspects as full uncertainty and no knowledge before deeper awareness and even action regarding many options. This means that individuals' preferences go through effects on cognitive, affective, and conative (behavioural, experimental) levels (CAC-expression; see e.g. Novak 2002).

As regards the intermodal choice, the CAC- expression is quite valuable in evaluating the perception of distance. If a decision-maker (e.g. a shipper, or more generallly an actor in a net) is at a cognitive stage, he or she has the basic information regarding the route. The knowledge is neutral and still quite a long distance is assessed in terms of cognitive distance. The affective level means more positive attitudes and preferences against a specific route or a counterpart. The conative stage refers to testing and experiencing the service promise provided by the operator. In addition, the successful co-operative activities as results of practical issues drive the individual's attitudes towards the conative level. The cognitive distance can be decreased by practical testing and gradual adjustments. In general, adoption as a process is more linked to situations in which an actor more unconditionally accepts the external pressures and their impact on his/her own activities.

Consequently, cognitive distance can be utilised to measure and evaluate the sum of factors hampering the interaction between the actors. Moreover, the position as a conceptualisation includes the notion that each actor subconsciously examines his/her own mental space, which means that there is both a constellation of locations for the actors and a bundle of dimensions impeding the interaction between the actors in their positions.

Distance analysis includes several imperatives for empirical the working procedure. It is essential to analyse the possible pitfalls and obstacles for deepening the collaborative actions among all the actors in a network. The perceptions are undoubtedly affected by non–subjective, concrete distance measures evident in the infrastructural network. With the help of appropriate methodology, cognitive distance measure can be applied in those situations where the main target is to assess the organisational proximity between the partners. The distance measure is significant for the roles of the operators, as well. The roles are often reinforced by closeness, because of the diverse actor bonds (and other links) between the operators (actors) force them for certain adaptations. It can be hypothesised that the more bonds there exist between the actors, the less perceived remoteness there is, and the stronger are the identifiable roles. Regarding the position of an actor in a network, it can be claimed that it is not possible to locate a single actor

without considering the organisational distance, as actors define their position as a relation to others. This is especially true when nets as subentities of networks are considered; the social distance either enables being a catalyst or hampers collaborative interaction.

Concluding Discussion

In this study the distance measure captures not only the physical proximity, but more the organisational proximity based on actors' perceptions of the obstacles and friction. The spatio-temporal dimensions, in general, are fundaments in the common interaction theory, though it has to be admitted that they are not fully explained especially in the field of logistics. The role of space and spatiality is vital in network studies. Instead of considering the concrete location of firms or operators (e.g. hubs, nodes, or facilities) as presumed in Supply Chain Management-based (SCM) thinking, it is worth analysing how a single firm is embedded in its surroundings, embracing also the analysis of the aspects of spatial embeddedness. Actors - whether alone or collegially - perceive and interpret the common space in a different manner, based on their own mental maps. Perceived distance – as presumed in the network view – can be an expression of interorganisational friction.

It can be assumed that the frequency of interaction between two points (e.g. actors often as nodes or hubs) is an attraction measure divided by some distance measure, as presumed in location theories. The attraction is a perception reflecting many determinants, forces and features and respective variables, and can be linked with bonding as well. The distance can be cognitive by nature, as often explained by often by network scholars, and have many variations, such as social, technological, and transaction based time distance; occasionally the term psychic distance is parallel to cognitive distance in IMP-related studies.

The enhanced distance analysis includes several aspects for the practical working procedure. It is essential to analyse the possible pitfalls and obstacles for deepening the collaborative actions among all the actors in a network, that is studied Perceptions are undoubtedly affected by non–subjective, concrete distance measures evident in the infrastructural network. With the help of appropriate methodology cognitive distance measure can be applied in those situations where the main target is to assess the organisational proximity between the partners. The distance measure is significant for the roles, as well. The roles

are often reinforced by closeness, because of the diverse bonds between the actors.

The conventional SCM theory is poorly equipped to explain the true nature of social elements; for this reason there is still a dominance of concrete and measurable distance measures in analysis. Among SCM practitioners there tends to be an illusion of totally managing the chains/systems. The network approach considers also social net(work)s addressing also the non-linear pattern of processes. The outcome is thus less deterministic, implying an impressionistic interpretation of the reality.

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APPENDIX 1

Newtonian-based Interpretation of Distance and Interaction

A general correlation for spatial interaction is (Sen and Smith 1995; Fotheringham and O'Kelly 1989):

$$T_{ij} = G\ (w_i P_i)\ (w_j P_j)^{\theta}\ /d_{ij}^{\phi},\quad \text{where} \qquad (1.1.)$$

Ti j= total spatial interaction between points i and j measured by means of flow from point i to j,
Pi = size (the population /the mass variable/the attractiveness /the attraction) of point i,
Pj = size of point j,
wi, wj = parameters reflecting the heterogeneity of masses (e.g. the population); similar to classical Newtonian hypothesis,
dij = distance between points i and j indicating spatial segregation
G = gravity coefficient (the gravitational constant – often e.g. demographic constant), and
θ , ϕ and δ are parameters - statistically estimated - for which θ, ϕ, and $\delta > 0$. In the classical Newtonian model for $\delta = 2$.

In a more reductionist view, it can be supposed that the distance decay function *per se* summarises all the effects of spatial interaction. The following correlation highlights the power deterrence function (Sen and Smith 1995, p. 4; also Martellato et al. 1998). The decay function can be expressed as follows:

$$F(d_{ij}) = (d_{ij})^{-\delta},\quad \text{in which} \qquad (1.2.)$$

Fij = is the intensity of attraction and
dij = distance measure (e.g. time/cost)

The basic model can be modified with the following determinants:

- the size factor, typically measured in terms of mass in the gravity models is replaced with the attraction of a particular point defined in terms of personal beliefs, values, preferences, and other adequate determinants of behaviour; these variables are context-specified and elaborate the situational features at one temporal point, and
- the distance is defined with some appropriate distance measure.

When configuring the basic model, the following hypothetical relation can be written:

$$T_{ij} = \sum_{i=1}^{n} (w_i C_{ij})/d_{ij}\ ,\ \text{where} \qquad (1.3.)$$

Tij = spatial interaction between points i and j,
wi = the proportional importance of factor in decision makers preferences at the point i,
Cij = the preference/ importance of factor i in point j, and
dij = distance between points i and j.

In short, the amount of interaction is directly proportional to the attraction of a certain point measured e.g. in terms of the decision maker's perception of that point and inversely proportional to the distance measure. The proposed correlation is consistent with the general model expressed by Sen and Smith (1995) as a compilation of many researchers' work; they claim that an extended, general class gravity model is Tij = A (i) B (j) F (dij), where A (i) and B(j) are unspecified origin weight functions and F(dij) is an unspecified deterrence function.

Essay 9

Common Carriers in Intermodal Rail and Sea Transportation Networks: Preliminary Empirical Evidence

Astract

The term common carrier has many connotations in freight transportation systems, depending on the context where it is applied, though mostly it refers to juridical interpretation. In this study the concept is approached differently, as the main objective of the paper is to discuss and compare the role of the common carrier (represented by a chosen focal actor in empirical analysis) in intermodal freight transportation networks. A bi-faceted and dualistic interpretation of the role-position concept provides a robust analytical basis for the study. The network-based approach as a theoretical suggestion with strong emphasis on inter-organisational issues (complementing the conventionally used normative and strategical/operational approaches) is strongly addressed. The analysis is based on preliminary theoretical presumptions related to empirical findings and comparison in the Finnish railway systems and liner shipping industry. The study shows that particularly in the railway industry the common carrier as an organisational role tends to have some typical characteristics, such as the executive's intention of expressing its strategic will openly. The railcarrier often aims at being truly neutral towards all the other operators. In pricemaking policy the principle of cross-subsidization, which is based on the idea of stability, ensures the continuity of neutrality. In liner shipping industry, some of the features – also as reflections of neutrality - are assumed to be valid as well, to name the liner freight making policy and its stability, which also implies non-discrimination between customers. In liner shipping industry the classical normative approach (referring to the influence of international conventions in practices) still dominates the examination, though the network-based approach could enrich both the theoretical and the empirical discussion.

Introduction

The term *common carrier* has many connotations, depending on the context where it is applied. Mostly, it is a legal concept, e.g. under the Anglo-American jurisdiction where common law- doctrine gives a solid basis for legal matters. Often the term refers mainly to shipping companies; e.g. the 1984 Shipping Act (together with adjustments and amendments in the Ocean Shipping Reform Act of 1998) defines a common carrier simply as a *'(…) person holding itself out to the general public to provide transportation (…) from the port (…) to the port (…)'* (Serko and Kane 2005). By interpreting the Act more accurately (and other inherent decisions and similar legislation), there are also some other characteristics for the common carrier, to name the common carrier's right to accept goods from whomever offers. Also, a common carrier may advertise sailings and solicit freight, meaning that there is regularity of service between ports: there can be many shippers who procure the transportation service, though often serving more than *one* shipper per voyage creates a presumption of a common carrier. As regards documentation, the use of special contracts of carriage (rather than some widely-approved documents like Bills of Lading) does not preclude a common carriage (Stemshaug 1996, 111).

The term common carrier can denote also to a specific *organisational role* having some special characteristics and respective indicators. Based on earlier studies (see particularly Nikkanen 2003b, Nikkanen 2004) it can be hypothesised that the status of the common carrier can be an interorganisational role for a specified focal firm in the transportation network context. Furthermore, this specific role can even be a reflection of the network identity. If an organisational role is defined in this way it is strongly in accordance with the expectations. On the basis of this specific role, the focal firm can express its involvement in the intermodal network.

Generally speaking, a common carrier in the transportation industry ought to provide services, which are based on the idea of equal treatment of customers; in service production some degree of objectivity is thus required. In railtransportation systems railway companies often capture a common carrier's tasks as they are obliged to do so: in many European countries there is still a government-erected monopoly for state-owned railway companies to perform solely the operations on domestic tracks.

In transportation service industry, attention and interest has been paid to *intermodal freight transportation* (IFT) networks, which provide the context for the

current study and both operational performance (e.g. Muller 1995) and scientific analysis have received more interest (Woxenius 1998, Aastrup 2002, Aastrup 2003, Nikkanen 2003b, Nikkanen 2004). Intermodal transportation has been conventionally defined as movement of unitised goods with at least two different transportation modes. Hence, IFT as a network phenomenon (which means that *intermodalism* is under scrutiny; see Nikkanen 2003b) provides an adequate testing ground to study the dimensions of interorganisational behaviour (and relationships) more exhaustively. There seem to be a tendency to complement the conventional, supply chain-based view and its technically-oriented analysis of transportation/IFT with new proposals and mindsets. Hence, the use of concepts that have parallels with modern (industrial) network analysis, can be a suitable starting point for research work. Accordingly, also the common carrier- theme can be scrutinised with the help of new conceptualisations (such as role, position and even embeddedness) instead of using traditional approaches and their technical-juridical schemes in the analysis.

Both sea and rail transportation operators are important in IFT, as the European Union would acknowledge with pleasure all activities that could remove some traffic from the congested roads to other modes; a better environment (reduction of emissions is achieved through a better balance between modes), congestion relief (the total costs caused by this effect), and safety (shifting traffic from modes with high accident rates to ones with lower rates) are some of the most notable reasons favouring the use of intermodal/multimodal transportation systems instead of unimodal solutions. In the evolution process for the modal shift, railway companies and liner shipping companies (particularly in short sea shipping) should have a more proactive role.

Scope and Objective of the Study

The major objective of this study is to *discuss and analyse the role of the common carrier in intermodal freight transportation (IFT) networks*. The study is based on preliminary theoretical presumptions related to empirical identification and comparison in Finnish railway systems and in liner shipping industry (represented by two focal actors in the empirical network analysis). Based on earlier studies (see e.g. Aastrup 2003, Nikkanen 2003, Nikkanen 2004), it is proposed that e.g. in railway industry, the common carrier as an organisational role performed by a railway company tends to have some typical characteristics, such as the executive's intention of expressing openly its strategic will, together with

predictable organisational behaviour. As such, the content of the conceptualisation common carrier depends on the approach that is utilised in the analysis (see subchapter 3 for detailed analysis).

As regards the concept of organisational role, it can be an illustration of dynamical aspects in a network; actually role can refer to an actor's intentions and expectations (Halinen 1994, Anderson *et al*. 1998). The term role is closely associated with the concept position: there is a strong interplay between these two terms. Position can be characterised through the actors' will, subject to an ideal and attainable organisational location in the network of tight relationships. In previous studies, also the *use of bi-faceted interpretation of the role-position – concept* and its coherent dualism has gained considerable success (see e.g. Anderson *et al.* 1998, Nikkanen 2003b, Nikkanen 2004). By combining these two terms, it is possible to capture not just the dynamical aspects of the network behaviour (as evident with role) but also the impact of the structural elements of the network for a single actor. Both these incorporated terms are needed to understand more promptly the dynamics in every network. A bi-faceted interpretation of the position-role- concept is employed throughout this study in order to address the behavioural aspects in the discussion of actors' choices in networks (see Fig. 2.1).

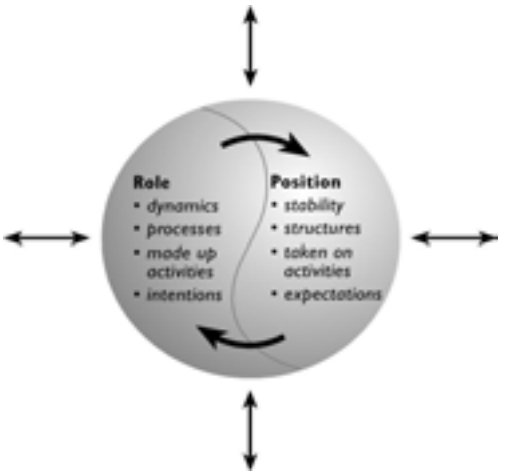

Figure 2.1 Dualistic nature of the role-position concept

Regarding the practical verification, it is a challenging task for the researcher to analyse the dualistic nature of the term/s comprehensively. As Aastrup (2003, 122) puts it *'(...) the concept of position may involve several underlying dimensions (i.e. resources and resource dependencies as well as expectations and roles) making it hard to define the concept in operational terms.'* Moreover, instead of aiming to explain the term/s, attention should be paid to other interests:' *it makes more sense to ask what the concept of network position directs our attention to and what operative phenomena to measure, identify or explore network positions through'* (Aastrup 2003, 130). Though some additional dimensions are sometimes included (micro and macro; limited and extended position; see particularly Johanson and Mattsson 1992), aiming at enriching the theoretical discussion, *analytically* these proposals as extensions do not contribute substantially to the research work by giving totally new mindsets, either (see also e.g. Aastrup 2003, Halinen 1994, Andersson *et al.* 1998). Hence, the relevance of modified terms is modest in the empirical investigation.

It should be noted that besides common carrier, there are *various other roles* for the operators in IFT, which appear either on a dyadic level (e.g. subcontractor, principal) or net(work) level (see Aastrup 2003, Nikkanen 2003a, Nikkanen 2003b). In IFT, the role of the common carrier is rather typical for *many* of the actors - to some degree also for road transportation companies, which take part in the network by providing e.g. linehaul service for moving unitised goods under various legs.

Viewing Common Carriers

The exact contents of the conceptualisation common carrier depend on the approach that is employed in the research work. The following suggestion (Fig.3.1) gives an impression of the various ways to interpret the term; basically *three* different approaches are presented.

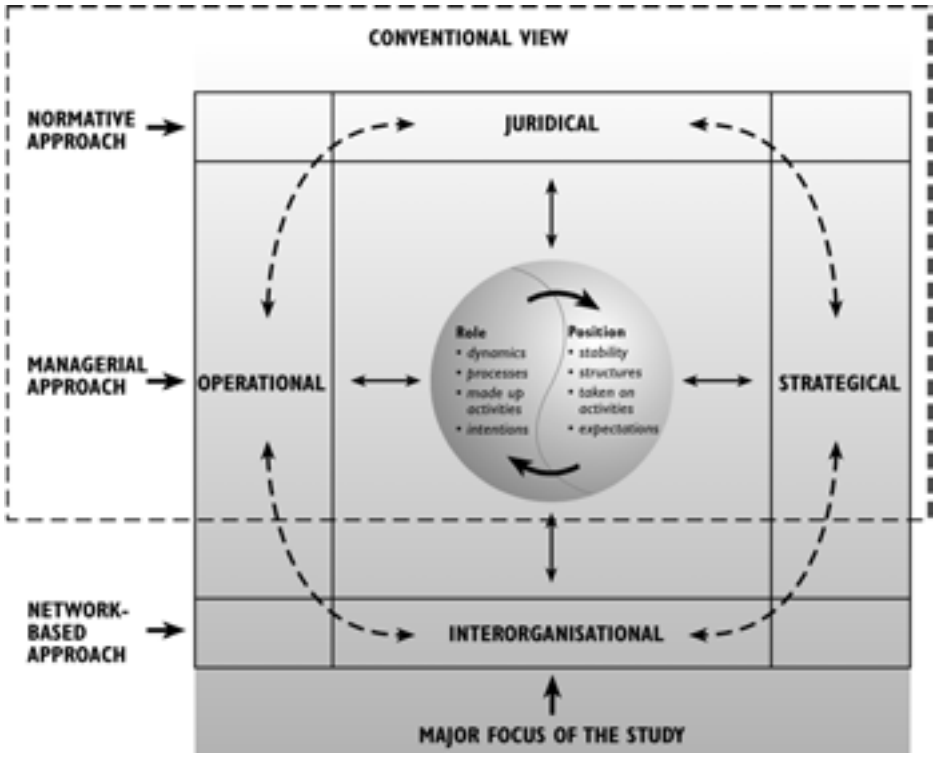

Figure 3.1 Different approaches for studying common carriers in the IFT network

As already mentioned, the *normative approach* with juridical and legal interpretation still dominates the discussion, especially in liner cargo shipping; the prevalence of international conventions (and their sometimes blurred nature) together with national, even local practices means that there can be plenty of potential sources for disputes. Despite some efforts to harmonize the practices (e.g. Standard Shipping Terms by ICC Finland as a suggestion for stipulating the responsibilities in loading and discharging in ports), disperse means in handling situations in different ports can cause a lot of trouble - not just for the carriers - but also for shippers and forwarders. From normative point of view, in railtransportation the concept of common carrier has a limited meaning: despite of some international conventions often the domestic laws and regulations stipulate the norms for practice. On the other hand, true internationalisation of railway companies in Europe has not even started: e.g. there is no true cabotage traffic partly because of substantial problems in solving questions of interoperability smoothly. Before solving technical problems, deregulation is required as well.

The *managerial approach* is widely utilised by operators in supply chains by addressing either the operational or strategical side of a common carriers' tasks, which facilitates the transportation performance efficiently. As such, the term common carrier implies certain activities (e.g. a carrier's responsibility of performing major leg in a supply chain), which are often limited by nature in contrast to all the activities of the entire supply chain. Hence, e.g. megacarriers often search for profitable market segments, others than simple transportation legs in order to expand the business base. In theoretical analysis, the examination relies more on classical modelling (the hypothetic-deductive approach and mechanistic Stimulus Response (SR)- scheme) attached by an urge to trace practical strategic or operational benefits. Under this view (and this is also valid with the normative approach) the supply chains can be defined as networks that are rather infrastructural by nature; these networks constitute points of origin or destinations and/or intermediaries between links having some functional character like warehousing, loading, or discharging. The links are the connecting elements: besides seaways and railway tracks, also communication and information linkages are examples of them.

The *network-based approach* provides an alternative view for analysing common carriers, complementing the conventional view (or perspective; see top-middle in Fig. 3.1). It is supposed that the network defined also as a social structure consists of social and other relationships between the partners or between nodes, which are e.g. individual persons or groups of people crossing the traditional boundaries between various organisations. The human nodes, which are regarded as actors, are frequently discussed in related studies. This implies that a network can be defined in general manner as set *of relationships between the operators*. Actually, to define a network accurately is actually an attempt with limited success as it is very difficult to depict the total scope of a network. It is not possible to delimit network appropriately, as every boundary is artificial. In order to describe network structures concisely, a limited and specified set of actors should be examined; in empirical analysis a constellation of appropriate relationships (defined as focal net) should be scrutinised, as most of the operators (such as common carriers) have only limited knowledge of the scope of the outer reality. Scientifically, the network-based explanation means that the research can be enriched by the proposals, concepts and ideas created often in social sciences, and more particularly in the social exchange theory; hence the conceptualisations (and adjacent analytical methods for analysing them) like role, position, power, embeddedness, identity and interaction are highly emphasised. Role and/or position and the terms' strong dualistic coherence are valuable tools for analysing the common carrier's engagement in the network; it can be postu-

lated that both the stability and dynamics of networks should be incorporated in the further analysis.

As regards IFT, there seems to be a need to complement the explanation of *'real processes'* (physical and concrete by nature due to business purposes) of moving unitised goods (e.g. containers, swap bodies and other ITUs) with the analysis of *'virtual processes'*, which often, but not always, take place in social interaction (organisational exchange, adaptation, and co-ordination: compare to the network-based approach in this study). The dominance of the Supply Chain Management –based perspective both in academic studies and among practitioners (and its deep *managerial* nature; see Fig. 3.1) and its strong emphasis on the real process give a solid basis for understanding the operational/strategical aspects of IFT, which undoubtedly influence the virtual ones. Inevitably, these two major kinds of processes are strongly interrelated: the real processes influence the virtual ones and *vice versa*. The network-based approach examines the IFT from a different angle, addressing mostly interorganisational themes and behavioural elements of network engagement.

Finally, it is proposed that the normative approach and the network-based approach represent even extreme perspectives. Occasionally, however, understanding of the utmost juxtaposition of a phenomenon can be interesting in detailed analysis. The managerial view for discussing common carriers, e.g. in terms of conceptualisation, has analytical proximity with both the above mentioned views.

Earlier Studies and their Contribution

Despite of the fact that IFT has been intensively contemplated by numerous scholars (see e.g. Woxenius 1994, 1998, Bukold 1996, Adjadjihoue 1995, Muller 1995, Gröhn 1998, Tuimala and Lukka 1999, Tuimala 2000, Bask *et al.* 2001, Aastrup 2003), there is a limited number of studies focusing on common carriers. In logistics research there are plenty of examples of analysing other identified roles than common carriers in transportation and /or IFT networks; hence, the discussion often reveals integrators, TPLs, megacarriers or other consolidators with little interest for common carriers (see e.g. Gröhn 1998, Tuimala 2000, Bask 1998, Bask *et al*. 2001, Andersson 1997, Berglund 1997, Herz 1993). Particularly in intermodal freight transportation, the term Multimodal Transport Operator (MTO) is widely applied by the freight forwarders and other third party logistics service providers, when they refer to their own responsibilities as consolidators. Typical for MTOs is that they are engaged in transportation activities,

characteristic for which is the movement of goods under door-to-door- conditions (compare: under the normative approach MTO denominates mostly an actor/person, who is liable for e.g. damages during the transportation). Practically, it can be assumed that the role of the TPLs/3PLs is to give a wide array of services by integrating a single carrier's - like common carriers' - service, and subsequently, sell these services to the clients. It is thus evident that a single operator carrying out the responsibility of an MTO actually takes responsibility of the whole transportation process covering all the modes. Often it is rather irrelevant whether the MTO carries goods by himself or whether he concludes subsequent agreements with subcontractors.

Also the *megacarriers* are often willing to enhance their traditional business performance with new initiatives, which means that the conventional transportation service (linehaul in specific legs) is extended by value-adding activities; some common carriers are determined to be megacarriers rather than common carriers due to expanded service production. The presence of a *virtual* integrator is also possible, though rather from a theoretical than from a pragmatical point of view. Basically, there are two different paths for taking the role of an integrator. A (common) carrier can expand its conventional business area by taking care of new VAL activities, and subsequently provide these service packages to their own clients, or a freight forwarder strongly combines the service as provided by the different modes, and sells the entity to their own clients, which implies consolidation.

Furthermore, there is a limited number of empirical studies analysing railway companies in general in IFT networks. Aastrup (2003) has investigated several different actors in railbased IFT in Denmark: combioperators (e.g. the partners of UICC) are links between forwarders and railway companies. In the case of a combioperator, a railcarrier is responsible of providing the haulage of trains (shuttle trains, scheduled connections, or block trains) in some specified leg. The combioperator consolidates the full trains, and markets the capacity to the freight forwarders based on terminal-to-terminal conditions. Thus, the freight forwarder actually has the role of an intermodal co-ordinator, since they provide door-to-door services to the firms which subsequently purchase the transportation service. Besides, a freight forwarder can carry the risk as well. In this sense, the relationship between a railcarrier *vis-à-vis* a combioperator is interesting for the intermodal efficiency, though not valid in Finland, since the absence of this kind of intermediary is evident. Moreover, it implies that either a focal firm or a forwarder, or some other operator can take the commercial risk or physical risk

(because often imbalance in container transportation between short leg and dominant leg).

Some earlier studies clearly indicate that the use of some specified dimensions in characterising more adequately the organisational behaviour of a common carrier can be an appropriate starting point for more detailed analysis (see e.g. Aastrup 2003, Nikkanen 2003b). With respect to a railcarrier (VR Cargo as a railway operator in the Finnish railway system), it can be suggested that the role is an *outcome of the focal firm's own decision-making and the intentions incorporated into them,* or there are *external constraint*s, which force the common carriers for a certain position in the IFT networks (Nikkanen 2004,528-529). Own decision-making and intentions mean e.g. that there is robust manifestation from the top management that the common carrier's role is of strategical importance, particularly prior to deregulation of the railway business. Thus, VR Cargo aims at being open for a substantially great number of IFT network members, and willing to deepen the collaboration; all accounts are intended to be equal in terms of customer satisfaction. A regards external constraints, VR Cargo is still a sole operator in railway business and its operations are subject to public surveillance. This requires a well-established cost analysis scheme in order to reduce the potential belief that the company could exploit unilaterally or abuse its official status (Nikkanen 2003b, 146-151). In liner cargo the market conditions are a bit different: fierce rivalry between the operators and the customers' (shippers, consignees, forwarders) expectations have a stronger influence.

Empirical Verification and Methods

In this study two companies - VR Cargo and Finnlines – represent rail transportation and liner shipping industry, respectively. As regards the operational Intermodal Freight Transportation in Finland, the movement of unitised goods by rail is performed by VR Cargo, which is a strategic business unit of the VR Group. As the focal actor of the study, VR Cargo is engaged in both international and domestic traffic; e.g. the Trans-Siberian Railway (TSR) connection as a block train service is offered jointly by several operators. As such, TSR service combines appropriately two continental markets, Europe and Asia. The focal company still holds the position of being a sole operator in rail-based intermodal business. There are, however, some plans to reject the government-erected monopoly and to open the markets (and network) for freer market penetration.

Finnlines is one of the largest European shipping companies specialising in liner cargo services; operationally, there are roro-based services for unitised and break bulk cargo, including also feeder container services in the Baltic Sea area. The services are performed by different units (Trans Russia Express, FinnLink, Nordö-Link and Team Lines). Small-tonnage traffic is provided by jointly-owned Intercontainers Ltd. The company is also engaged in port operations.

In IFT, there is actually an abundance of players on international (e.g. freight forwarders as consolidators, co-ordinators and integrators), national (shippers, seaports, dryports) and regional levels (towns and municipalities), which all affect the decision-making of the network operators. In this study *a focal company* encapsulated by *a focal net* is under consideration rather than the entire IFT network.

In the empirical part of the study, a number of interviews were conducted to analyse pragmatically the contents and dimensions of the term common carrier in order to compare and contrast the role of the common carrier in the railway systems and in the liner shipping industry. The study was conducted with the help of semi-structured questionnaires with selected practitioners in railbased and seaborne IFT. The sample consisted of VR Cargo's major partners in intermodal freight transportation. Totally, the informants account for a major part of the total revenue of the focal firm in domestic IM business. Some of the informants did not have any contractual bond with VR Cargo or any direct business relationship, but as their decisions and perceptions are important in general, and because their indirectly influence the traffic, they were chosen as informants (see also Nikkanen 2003b, 126-130, 210-211). After an intermediate synthesis had been made in the railway industry, a second-round of in-depth interviews was conducted in order to reveal the circumstances in liner cargo (with Finnlines Plc as a focal actor); especially juridical themes were in focus.

Characteristics of Common Carriers

Neutrality

Irrespective of modes, one of the typical features characterising all the common carriers is their *neutrality*; it is actually a form of network engagement in which an operator is unwilling to openly create any kind of exclusive arrangements with some operators, as they might be regarded as hostile or discriminative by some

others. This means that all activities (whether operational or strategical) can be subject to external assessment conducted by some actors (or by shippers, customers, consignors). In order to maintain proper neutrality, a common carrier is often obliged to *certain adaptations* (even coercive adaptations) in its policies in order to maintain the neutral character.

Brennan and Turnbull (1998a, 398) define dyadic adaptation by stressing the behavioural and organisational modifications *at multiple managerial levels;* these actions are '*designed to meet specific needs of one other organisation'*. The adaptation consists of three main elements: all the identified behavioural (social), organisational, and technical modifications and configurations for the network partner or operator. The major trigger for the modified behaviour is often an external constraint, expectations, or opportunities, which require reactions within the entire network. This implies that a recognised conscious incident can be a part of the adaptation process. However, some of the adaptive actions are unconscious by nature, and an actor can employ a new role without any personal notice. Adaptation is not just a process indicating some form of a relationship, but a critical element in a relationship as well, because it creates mutual trust for the operators. Hence, the prevalence of adaptative actions between two parties indicate the maintenance of a long-lasting relationship, whereas the lack of adaptations refers more to transactional and simple *ad hoc*- type of relationships (Brennan and Turnbull 1998b).

In the role of the common carrier an operator, especially the management representing it often intuitively and implicitly aims at exposing a rather stable and predictable managerial and organisational behaviour – and respective policies (e.g. in terms of freight rates, schedules, routes). As regards price making policy, the principle of cross-subsidisation is adopted to stabilize the freight rates; as such the common carriers are determined to modify their pricing policy in quite a modest way to express and gain *proper* neutrality, which is required because of overreaction, e.g. in terms of new radical initiatives and tends to cause inconvience, even open disputes, for other network members. Hence, appropriate methods for increasing the neutrality are the policies for determining the freight rates aiming at bring equal treatment for all the accounts, regardless of their size or attraction as a partner (despite of loyalty rebates).

Both in railway and in liner shipping industry the operations are based on the assumption of regular service from form port to port (or region to region or yard to yard); augmented service production is *not* typical for common carriers. Because the tariffs are based on rather stable pricing policy, the business is highly intrinsically vulnerable to price competition as there are often many carriers (or other

modes) operating in the same routes or areas. Unlike in rail transportation, in liner cargo the carriers often use additionals and surcharges for increasing or adjusting the rates; the use of CAF, BAF, and PCS are a rather typical and vital part when freight rates are determined. Though harmful for the clients, by doing this the shipping company clearly expresses the reasons for the increased rates; the announcements attached to the use of additionals are one way of justification as well. Generally, the price-making procedure supports the neutrality of the operators.

Responses to External Constraints

In order to maintain neutrality, common carriers need means and methods for responding and behaving adequately in relation to the outer reality. In this subchapter the legal and managerial (and constraining) framework that influences the responses is discussed; particularly in liner shipping there is a number of external juridical constraints. The liabilities as obligations affect the roles of the common carriers as well. In the next subchapter (5.3.), common carriers are analysed mainly through expectations, which is typical for the network-based approach and its interest for interorganisational issues.

There exists actually a set of legal concerns, which form a hierarchical, multilayered system of the laws and practices which are applicable to carriage of (unitised) goods (hence influencing the common carriers strongly). In Figure 5.1 a comparison is made to address the differences between the normative approach in contrast to the managerial one in illustrating and distinguishing the liabilities.

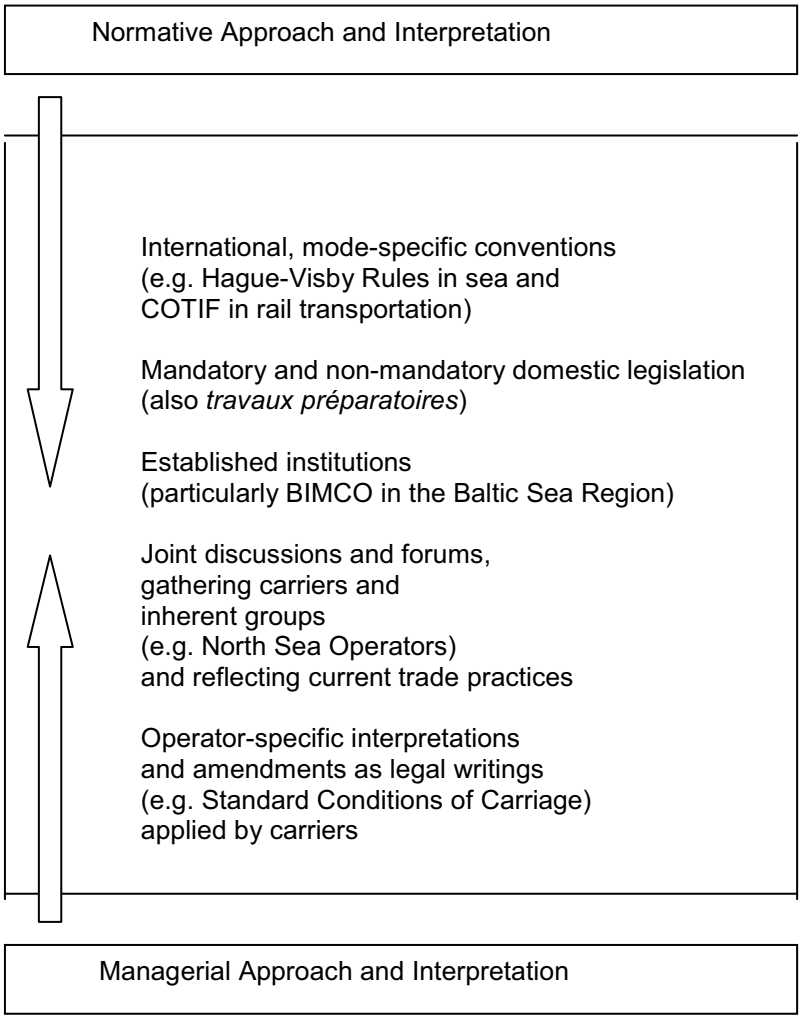

Figure 5.1 Managerial and normative views for assessing the external constraints of common carrier

As regards the division of liabilities in general, there exist basically two different forms - network and uniform systems - for handling and determining the basis of liability of the MTO. The network system means that the liability of the MTO is based on the existing mandatory rules on each concrete part of the carriage. The uniform system, in turn, provides a different basis: entire route and every leg are under the responsibility of the MTO regardless of where the real damage took place. Hence, the uniform system is subject to potential conflicts with the

existing international conventions and national laws. Indeed, with regard to liabilities, some international conventions for single modes have instructions for multimodal purposes as well; domestic laws have often parallels with the international ones.

The legal aspects of intermodal transportation, especially the liabilities, are also associated with appropriate documentation, which can indicate conformity between the common carriers. Critical for intermodal freight transportation is not just the content and form of documents, but how they are interpreted, what is their role and - what is more important - what are the implications for practical procedures between the main partners: shippers, carriers, and receivers. Besides documents, also contracts (of carriage) are important, but also problematic in multimodal/intermodal solutions. Some independent organisations have launched their own documents (e.g. COMBICONBILL by BIMCO, FBL by FIATA), and the International Chamber of Commerce (ICC) has created ICC Rules for multimodal transportation and documentation. Finnlines uses documents that have parallels with the ideas approved by North Sea Operators Standard Conditions of Carriage with some alterations and refinements in applied clauses; hence the company issues its own B/L or LinerWayBill/(LWB) with slight modifications containing reference also for Hague-Visby Rules as amended in 1979. In international railtransportation the so called CIM- waybill is used in westbound traffic; in eastbound a special waybill, which is based on bilateral agreement between Russia and Finland, is used instead. The Multimodal Transport Document (MTD) is mostly applicable in combined transportation solutions.

Because no uniform, world wide legislation for intermodal cargo exists, a carrier as the MTO can quite freely and independently define the terms and conditions for haulage (in Scandinavia there exists, however, General Conditions of the Nordic Association of Freight Forwarders to substitute the absence of a uniform law). It seems that in IFT there is no single big operator who could take the full responsibility, which means that the range of TPLs (forwarders, Nonvessel Operating Common Carriers, mega-carriers) give service that consolidates the transported goods, plans different routes and modes, and has several other integrator-alike functions.

Responses to Expectations

Particularly in the network-based approach the role-position concept provides a robust starting point for analysing common carriers; thus intentions and expecta-

tions are primarily in focus (compare to Fig. 2.1.). These expectations in the stable net(work)s delimit the scope of behaviour. Hence conflict resolution methods are worth discussing as well: they are actually of paramount importance to understand the logic of the common carriers' behaviour.

In IFT business, the means of conflict resolution are strongly incorporated into the roles of the companies. When analysing common carriers this is an important notion in order to understand how the operators aim at maintaining organisational neutrality. In intermodal network with stable structural elements, the roles are based on a settled division of tasks, and changing the role is always subject to minor changes in structures. Moreover, the role means that a single carrier is willing to express its commitment to behave as presumed under a specific role; actor bonds, and more specifically, the influence of structural bonding, favours the use of conventional – such like common carriers' - roles. As such the roles of the common carrier delimit the scope of behavioural responses.

Consequently, with the help of bonded structures and because of the constraints set up by the members of the network, the role of the common carrier is performed in a *rather limited scope*. Despite of other organisational roles, common carrier is often a dominant role for focal firms in the net(work)context (this is especially true with railway companies). The following illustration depicts the amplitude of the expected patterns of behaviour.

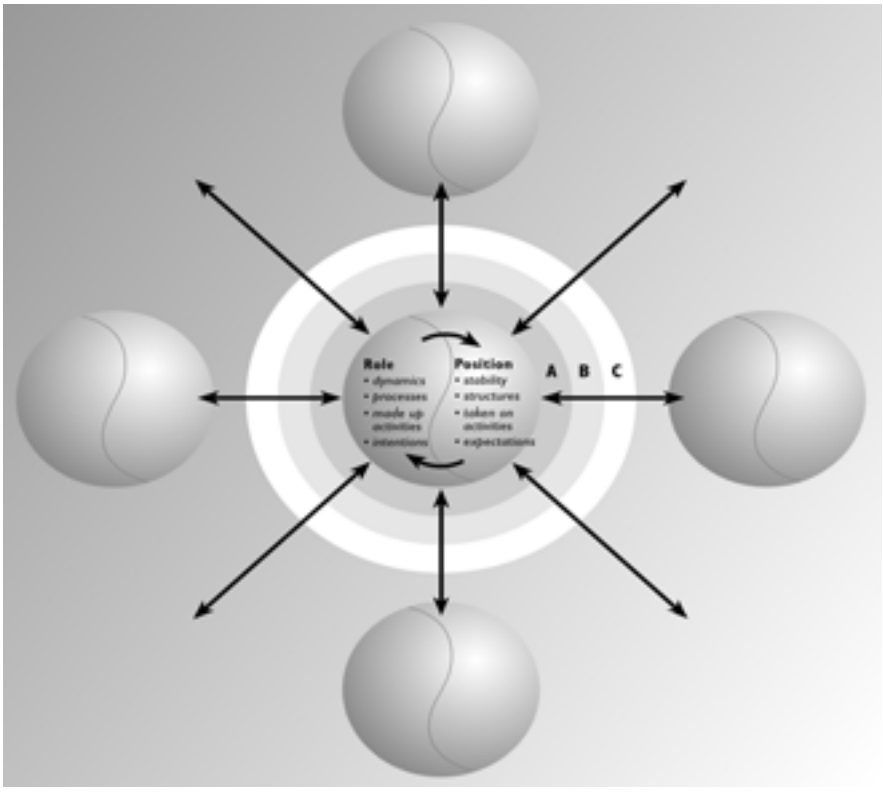

Figure 5.1 Amplitude of expected patterns of behaviour for a common carrier in IFT

In the illustration the following areas are represented. *Area A* describes the area *expected* by the counterparts, because the role embraced by the focal firm is consistent with this kind of behaviour. Moreover, it is *accepted* as well, since it does not disturb the internal harmony and the settled tasks in the network. In general, the counterparts are willing to perceive this type of behaviour in a positive manner, since it is interpreted to be in accordance with the chosen course of action. *Area B* is not expected, but it is accepted by the other operators in contrast to *area C,* which is neither expected nor accepted by the other operators. Thus, the focal firm is not willing to carry a risk of radically expanding to new business areas which are not presentations of its own core competency and primary activities.

Repositioning

The discussion indicates that it is actually very difficult for a common carrier to expand the business to new areas with the help of repositioning. One of the possible trajectories, which is well-understood by common carriers (and other operators), is the path for the role of an integrator. The role of an integrator means that in IFT a carrier can be defined as a Multimodal Transport Operator (MTO). This implies that both in operational sea and rail-based intermodal freight, the transportation service as an activity performed by the common carrier is still strongly based linehaul service of unitised goods complemented occasionally by loading, discharging, and terminal operations. This is especially true in liner shipping with the general cargo that consists of consignments of various kinds: in IFT containerised cargo is a typical example. Though prominent, the scope of these activities is limited to one part of the logistics in the entire supply chain.

One of the major obstacles for repositioning are the structurally bonded relationships in IFT causing *inertia,* which hampers or even eliminates the efforts for new roles. For some of the researchers inertia actually means *unwillingness to change current organisational behaviour,* and thus maintain the existing roles (e.g. Ford *et al.* 1998). In addition, it is possible to define relative structural inertia when internal, intraorganisational forces to resist the changes are described (Ruef 1997). Easton (1992, 23) claims that strong (actor) bonds, which are quite stable, mean inertia.

In repositioning procedure, the new potential role of the service integrator for a common carrier is interesting, since it is assumed that this role is *not truly* performed by *any* operator in the IM business (cf. Gröhn 1998). Conventionally, the tasks and liabilities associated with this role are mostly connected to the freight forwarders, often also called consolidators, or Non Vessel Operating Common Carriers (NVOCCs). The practice of one-stop-shopping also refers to freight forwarders in their attempt to expand the business opportunities. Though of great interest, this particular role is not suitable for VR Cargo due to various reasons, starting from the idea that there is no clear, visible, and public statement from VR Cargo's side to support this type of a situation. On the other hand, none of the carriers and participants in domestic IM can be regarded integrators since the use of the service provided by the freight forwarders' is not needed in national service. Often, however, *freight forwarders consolidate the activities rather than integrate them.* Besides combioperators' also globalised forwarders or megacarriers can be classified as integrators. A railcarrier's capability is limited

and the resources are scarce for this role; on the other hand it is not a major aspiration for the firm either. A liner shipping company and the shippers (while creating chains for in-house operations) or the receivers can occupy this role, depending on the leg and the critical points for dividing the tasks.

One of the prerequisites for the role of an integrator could be an own information system, either totally independent or integrated to some parties' information systems. *Knowledge* can be one of the major intangible resources for common carriers to start to integrate the IM chains. Though a dominant actor is presumably not evident in IM business (which is in accordance with the proposals of the network-based approach), there is need to co-ordinate the processes. Co-ordination can be even crucial for the integration of diverse tasks in order to ensure more harmonious and smooth operations.

Conclusions

In this study the aim was to combine and contrast conventional perspectives with a new one in order to approach common carriers, which are typical operators both in liner shipping and in railway transportation systems, especially when unitised cargo is transported. A network-based approach as a suggestion with strong emphasis on interorganisational issues (complementing the conventionally used normative and strategical perspectives) was strongly addressed; this approach absorbs the idea of using concepts which stem from (social) interaction theories *inter alia*. In this study a bi-faceted and dualistic interpretation of the role-position concept provided a robust analytical basis throughout out the study.

It seems that the common carrier's role is strongly associated with the idea of neutrality. Operationally, this means that all the accounts are equal in terms of customer satisfaction and there should not be any discriminative or exclusive arrangements with just some operators; adjustments and adaptations intensify the captured role. Moreover, sufficient organisational responses are required to maintain neutrality properly. As regards a railcarrier, the focal company of the study (VR Cargo) is also obliged to its role because there is still a government-established right to maintain solely the railway operations on domestic tracks. As such, the role of the common carrier is affected both by external constraints and expectations and by firms' internal intentions. Some of the intentions are targeted for other members in the net (an identified subentity of the entire network structure), others for the entire intermodal freight transportation network. The other potential roles (such as that of an integrator) are often extensions of the

role of the common carrier. In liner shipping industry the classical normative approach (referring to international conventions) still dominates the discussion, though the network-based approach could enrich both the theoretical and empirical discussion on operators.

Abbreviations

BAF	Bunker Adjustment Factor
B/L	Bill of Lading
BIMCO	The Baltic and International Maritime Conference
CAF	Currency Adjustment Factor
CIM	International Convention for Road Transportation
COMBICONBILL	Multimodal Transportation Document Introduced by BIMCO
COTIF	Convention concerning International Carriage by Rail
FIATA	International Federation of Freight Forwarders Association
FBL	FIATA Forwarders Bill of Lading
ICC	International Chamber of Commerce
IFT	Intermodal Freight Transportation
IM	Intermodal, Intermodalism
ITU	Intermodal Transport Unit
LWB	LinerWayBill
MTD	Multimodal Transport Document
MTO	Multimodal Transport Operator
NVOCC	Non-vessel Operating Common Carrier
PCS	Port Congestion Surcharge
TPL	Third Party Logistics (3PL)
TSR	Trans Siberian Railway

UIRR	International Union of combined Road-Rail transport companies
VAL	Value Added Logistics

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There has been growing interest recently to study and analyse networks, both among academics and practitioners. As firms, such as logistics service providers, become more global, it has been realized that success does not depend simply on the performance of individual companies, but rather in the collective performance of all the actors engaged in the networks. In logistics, Demand-Supply Chain Management (DSCM) has traditionally dominated the research work and discussion. In this publication the conventional approach is challenged. In contrast to DSCM, networks are understood mainly as sets of diverse relationships between various actors. In every interorganisational network there are tendencies towards co-operation but also for forces that are harmful, even destructive for collaboration. There is a need to elicit these elements from an analytical point of view. The essays of this book discuss and analyse interorganisational convergence and divergence using mainly logistic networks as the application area. Transportation systems and supply networks are mainly under consideration. Due to its versatile nature, the book can give new mindsets for scholars and practitioners approaching and studying interorganisational relationships and networks in other contexts as well.

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